CRIME SCENE

A Quarterly Newsletter of the Northwest Association of Forensic Scientists

From the Editor's Desk

THE GOOD OLD DAYS

Although it may be politically incorrect, who amongst us has not sneaked a look at the O.J. Simpson pretrial on TV. It does seem to exert a weird fascination. "Thank God it didn't happen in this state," or "I'm glad I'm not on the witness stand in front of 200 million people," are statements I have heard from many colleagues. If a case of this magnitude happened in our patch would we do as good a job? Luckily we won't have to worry. Maybe we should.

Every newspaper has at least one editorial per week that highlights abuses of scientific evidence in the criminal justice system. Most of these tabloids, in typical journalistic style quote another publication as their source of truth, namely the Seattle Times, that ran a five-part series on Washington state crime labs in June this year. "At any time thousands of pieces of evidence collected from crime scenes sit unanalyzed and ignored on shelves in laboratories and police stations across the state." I think I have seen that quote at least five times. Do we warrant all this scrutiny? I think we do.

Ten years from now this time may be seen as the good old days. All the hullabaloo in the media about forensic scientists, pathologists and DNA statistics will be fondly remembered as mere ripples in the lake of professional complacency. Wait until the commotion dies down and the media finds something else to pay attention to. Just do your analysis, after all if no one says anything then I must be doing it right. Perhaps someone should say something.

If this trial (sorry, pretrial) makes us think about the work we do and how we present it then it has served a useful purpose. I would imagine that Certification, the bête noire of this Association, will be mentioned again. Proficiencies, declared and undeclared, will increase in number. Testimony will be more rigorous.

Yes, in 2004, this will seem like the good old days.

NWAFS MEETINGS

Every member has received all the information needed to get to Vancouver (That's Canada again, Mr. McDermott).

It's hard to believe we're in the last quarter of 1994, maybe time goes faster as you get older. It is time to get ready for 1995.

George Taft in Anchorage tells me that the joint NWAFS/Alaska Peace Officer's Association meeting scheduled for May 8-12, 1995, promises to be a good one. Someone from Anchorage will be at the Vancouver meeting to give members more information.

Wayne Ferguson in the National Fish and Wildlife Forensic Lab in Ashland has already begun preparations for the NWAFS Fall meeting scheduled for October 16-20, 1995. I was fortunate enough to receive a tour of the lab last year from Mary-Jacque Mann, and a trip to the meeting, if only to see the lab and the fascinating work the scientists do there, would be well worthwhile.

Terry McAdam

Idaho On The Move Again!

It's happened again. Last issue I reported that the folks in Boise had moved to Meridian, well now the people in Coeur D'Alene lab have moved.

Their new address is as follows:

Dept. of Law Enforcement
Idaho Bureau of Forensic Services
1000 Hubbard Suite #240
Coeur D'Alene ID 83814-2277

This information applies to the following members:

Stuart Jacobsen
Bob Martin
Chet Park

President's Message . . .

Time passes quickly, and my term is nearing its end. This is probably my last message and I would like to do a little reflection, at this time.

As in any organization, there are varying periods of flux. I think we have been in one of the slow, quiet periods during my tenure, but that most certainly is changing. Realizing where we are in this dynamic cycle, we should also be aware of what will shortly be influencing our Association. Throughout our Region caseloads are increasing drastically, and the judicial system makes more demands on our laboratories and personnel. Public perception about our profession is also changing, and with strains on the system, we are routinely viewed as the bottleneck. Costly technology is continually coming on-line, yet often the public won't believe the bottom-line and refuses to pay the bill. And how often does a governing body feel that travel is luxurious, and should be cut whenever possible. All of this looks like we should securely fasten our seat belts, and prepare for a bumpy ride.

Where do we go to answer the problems asked above? Hopefully we start through communication within our regional associations. Maybe time spent at future meetings should address these issues in a forum setting. Maybe training sessions given by individuals (public and private) who have previously dealt with these problems.

Yet with all of the strain appearing in the system I have been pleasantly surprised at how many of you have offered to take on the extra duties involved with this Association. Shortly we should have a revamped Constitution and By Laws. The Executive Board has put in place an Ethics and Program Committee, with each given the latitude to set goals and their respective agendas. Proficiency testing will be expanding greatly with ASCLD/LAB and ABC requirements. All of these concerns required a number of members who put in the extra time to attain these goals. As well, membership has increased, and offices within the Association are being contested by a number of nominees, rather than going to appointment.

Take heart. What this all means is that we are up to the tasks at hand. We are passing through an unusual transition period with the Association, but we have prevailed in the past and will do so in the future. As Larry assumes his new role, I hope each of you will continue to provide support and affirm your ties to this Association. Thanks for a great term.

Don Wyckoff

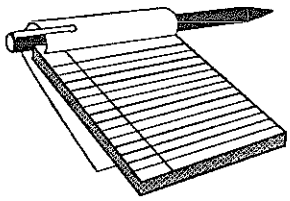
NWAFS Officers - 1994

Executive Committee

President	Don Wyckoff, ID Bureau of Forensic Services - Pocatello, ID
President-Elect	Larry Campbell, Regional Coroner - Vancouver, BC Canada
Member-at-Large	Lisa Caughlin, Sacramento Co. Crime Lab, Sacramento, CA
Past-President	Ken McDermott, WSP Crime Lab - Kelso, WA

Committee Chairs

Continuing Education	Arnold Melnikoff, WSP Crime Lab - Spokane, WA
Historical	Brad Telyea, OSP Forensic Lab - Portland, OR
Membership	John Bowden, CA Criminalistics Institute - Sacramento, CA
Technical Advancement	Rick Groff, ID Bureau of Forensic Services - Boise, ID
Editorial	Terry McAdam, WSP Crime Lab - Seattle, WA



Letters To The Editor

Editor, The NWAFS Newsletter,

In the last newsletter, you asked for thoughts on ways to make meetings more affordable. Here is a modest proposal to help those who pay their own way; members of the host laboratory could offer their homes for hospitality and provide transportation to the conference if need be. If the number of people needing hospitality were to exceed the capacity of the hosts, preference would be given to those who had extended hospitality in past meetings. If there are more offers of hospitality than takers, those whose laboratories are sponsoring them would also be eligible. Several scientists whom I approached with this idea would, like me, be willing to be hosts.

Sincerely,

Chesterene Cwiklik
Cwiklik & Associates

I hereby propose the following Bylaws change/Addition:

Chapter III Committees

Section 2 Standing Committees

F. Finance Committee consisting of the President-Elect, Treasurer, Fall and Spring meeting Chairpersons, and one member volunteer. This committee will develop a line item budget that will be published in the Newsletter for membership review. This budget will be voted on at the Fall Business meeting. A 3/4 (three-fourths) approval vote of those members voting will put this budget in place for the operating year.

My thoughts in support of this issue are as follows:

1. To provide a forum for membership monies allocation
2. To ensure that the President-Elect will have the finances to promote his/her year of office
3. To encourage membership participation/ownership of the organization.

Alternatively we could include a budget ballot in the Newsletter that members could send to the Executive Committee. A 3/4 approval mail vote would then put this budget in place for the operating year.

Respectfully submitted,

Robin Bussoletti
WSP Crime Lab, Seattle

Report of the Technical Advancement Committee

Rick Groff, IDLE-BFS.

This spring, the Technical Advancement Committee sent out a questionnaire regarding the needs of the membership for proficiency testing. A questionnaire was sent to every member. Responses were received from 10 members. Some responses represented entire labs and some represented individual members. Ranked from most important to least important, the 10 areas of greatest concern to the members that responded were: hairs, paint chips, drugs-firearms (tie), fibers, glass, tool marks, miscellaneous matching, serology, and headlight on\off.

Based on these responses, the committee established the proficiency testing that we will provide during the rest of our term of service. Firearms will be sent in August, glass in September, hairs in October, and fibers in November if everything goes according to plan.

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 requested written material submitted for publication to the Newsletter be word processed using WordPerfect 6.0 or Microsoft Word for Windows 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 **Terry McAdam, WSP Crime Laboratory, 2nd Floor Public Safety Building, Seattle, WA 98104, (206) 464-7038, (206) 587-5023 fax**

One drug proficiency test was sent out early last spring, but no more will be sent out by NWAFS until the legality of solid dosage proficiency testing is resolved. In the 1994 spring meeting, a question was raised as to whether NWAFS could lawfully send out proficiency testing of solid dosage drugs and drugs in biological samples. It does violate federal law to send schedule I and schedule II controlled substances without an order form according to DEA officials in Seattle. These officials could not find a loophole for us in the law. Dick Frank of DEA indicated that he supported proficiency testing. He said he would help to obtain the exemption from federal codes necessary for us to continue proficiency testing solid dosage drugs. However, I am now dealing with regional DEA officials on the issue again. Therefore, the question of whether we will get an exemption or not is still unresolved. I doubt that we will ever be able to send solid dosage proficiency tests to Canada, exemption or not, because international drug agreements come into play. Dick and I agree that the small quantities of drugs in toxicology samples probably exclude them from DEA control. My goal is to resolve these issues before my term as chairman ends.

At the beginning of my term as chairman of the technical advancement committee, I believed that the value of NWAFS proficiency testing would diminish as ASCLD/LAB standards and ABC standards were tightened. However, the rules established by ASCLD/LAB proficiency review committees are likely to make proficiency testing obtained from Collaborative Testing Services (CTS) much more expensive. Meanwhile, the necessity for proficiency testing will only increase. Therefore, I believe our technical advancement program could be providing more samples in more disciplines in the future.

NWAFS February 1994 Drug Proficiency Sample Results

Katherine S. Wilcox, OSP, Coos Bay.

The tablets were from D & E Pharmaceuticals. They contained Ephedrine HCl, 25 mg and Guaifenesin, 100 mg.

I got the number from an ad in High Times magazine. (Interestingly, they would not ship to me since I'm in Oregon so I had to ask Lionel Tucker to order them (he is in California).

35 proficiency tests were sent out.
24 Responses were received (1 did not have time to analyze)

Answers To Questions:

1. *What active ingredient(s) was identified? Controlled Substance?*
   Ephedrine and Guaifenesin 17 (5 of these also listed Pseudoephedrine/Ephedrine)
   Ephedrine 2
   Not a Controlled Substance 8 (3 listed ephedrine as a controlled precursor)

2. *What fillers, if any, were identified?*

Did not identify any fillers	20
Glycerol Quaiacolate	1
Cellulose and sugar, possibly sorbitol	1
Celluose	1
Starch	1

3. *List screening tests:*

Checked LOGO's	1
Chen's	3
Cobalt T	4
Color Tests	3
CoSCN	3
Crystal Test	1
Dillie-Kop	1
Ehrlich	2
Froehde	5
GC	3
GCMS	3
IR	2
Leibermans	7
Mandelin's	3
Marquis	16
Meckes	5
Microcrystal	1
Primary Amine	1
Secondary Amine	2
TLC	1
Toxi-Lab	1
UV	1

4. *List extraction/isolation/purification methods used:*
   Many variations here of $CHCl_3$ extracts and other extracts also.

5. *What instrumental or other methods were used to confirm substance(s)?*

Crystals	1
FTIR	18
GC	1
GCMS	18
Not Confirmed	1
UV Screen	1

6. *Comments*

Mass spectra of unknown is consistent with guaifenesin and ephedrine/pseudoephedrine when compared with the lab library.

I probably would not have done this much work for a case.

Depending on the charging policies of the prosecutor in this case I would either report this as non-controlled or I would write in the report a qualification that this is not a bulk sample of ephedrine suitable for synthesis.

California requires another medicinally active ingredient for ephedrine to be sold over the counter.

This is an over the counter combination, but could be used to make methamphetamine.

Attempted IR for ephedrine, but not sufficiently purified.

This lab reports ephedrine as controlled, although some tablet forms of ephedrine are exempt. We let the prosecutors in our area make the decision or whether to pursue the case or not.

We will accept future drug proficiencies.

Tablets were analyzed as a composite.

Couldn't purify easily enough to get good IR data.

Very nicely made tablets—considerable better than we usually see (and we see millions of these little beggars).

The combination of ephedrine and guaifenesin can be found in certain prescription cold medications, such as Broncholate. Prosecution of ephedrine cases varies greatly in this area, but the fact that thousands of the tablets were found in an unlabeled jar at a clandestine meth lab would make a strong case for possession of ephedrine as a precursor to the synthesis of methamphetamine.

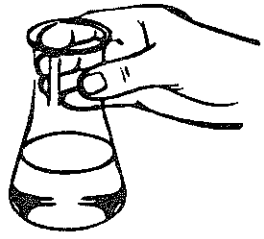
Schedule of ephedrine is left to the prosecutor. Ephedrine is a controlled substance (Schedule II) if used as a precursor in the manufacture of methamphetamine.

Physical identification over telephone by D & E Pharmaceuticals, 25 milligrams Ephedrine plus Guaifenesin.

Ephedrine can be a controlled substance precursor for the manufacture of methamphetamine or methcathinone. It is not a controlled precursor in Colorado.

Gunshot Residue Roundtable Discussion

A gunshot residue roundtable discussion is scheduled for the joint meeting of the Canadian Society of Forensic Science and the Northwest Association of Forensic Scientists, in Vancouver, B.C. The roundtable is scheduled for the morning of November 3, extending on into the afternoon, if necessary. The purpose of this roundtable will be to share unpublished research and discuss interesting cases and problems and/or solutions. Anyone interested in GSR analysis is invited to attend, and anyone who has done any GSR related research is encouraged to bring their results and share with the rest of us. Potential topics include when and where to sample, significance of the number of GSR particles, report wording and different sampling / testing methods employed. If anyone has any topics for discussion, research to present, or questions concerning the roundtable, please contact Frank Boshears, Washington State Patrol Crime Lab at (206) 593-2006. For questions concerning the general meeting, please contact Jeff Coughlin, RCMP Lab, Vancouver, B.C.



Job Openings

1. The Washington State Patrol Crime Laboratory Division is seeking experienced applicants to fill a Serology position within the division.
   Salary Range: Forensic Scientist 3, $36,132 - $45,096
   Minimum requirements:
   Bachelor of science degree in forensic science or a natural science degree which includes 20 semester (30 quarter) hours of chemistry and 5 semester (8 quarter) hours of physics, plus three years of full-time, paid technical experience in a forensic science laboratory, which includes testifying as an expert in a court of law.
   Contact:

   Captain Robert Leichner
   Washington State Patrol
   Crime Laboratory Division
   PO Box 42632
   621 Woodland Sq. Loop
   Lacey WA 98504-2632

2. The Palm Beach Sheriff's Office Crime Laboratory is currently accepting resumes for Forensic Scientist II (Firearms/Toolmark Examiner). Position is planned for FY 94-95.
   Minimum Qualifications:
   Bachelor's degree in a physical science plus three years experience or high school diploma and five years experience in Firearms and Toolmark Identification. Applicants must also be court qualified in this discipline.
   Duties:
   Analyses of firearms, toolmarks, clothing for gunshot residues, and serial number restorations in a full range of casework.
   Applicants are subject to background investigation and post-job offer processing includes polygraph, physical and drug screening.
   Salary Range: $32,928 - $51,128
   Submit resumes to:
   Personnel Director,
   Palm Beach Sheriff's Office
   3228 Gun Club Road
   West Palm Beach, FL 33406
   Direct inquiries to:
   John O'Rourke, Forensic Firearms Examiner, (407) 688-4220 or Richard Tanton, Lab Director, (407) 688-4204

Two Shoe Impression Cases

BILL SCHNECK, WSP SPOKANE

Editor's note: My good friend the most Reverend Doctor William Schneck of the parish of Spokane, WA, craves your indulgence and asks that you look kindly on his humble submission.

Case 1: "How automobile tires are recycled to save the environment" or "Tires that walk."

An interesting pair of sandals was examined in our lab recently. The outsoles were composed of recycled automobile tire tread exhibiting partial tread elements and the sidewall element running the length of the sandal. The letters BFG (B.F.Goodrich Tire Company) were visible on one of the sandal outsoles. The out soles were bound to the insole by long randomly applied staples that were then hammered down in to the outsole. The crude method of construction created unique manufacturing characteristics. Sandals of this type are produced in Mexico and coincidentally in Colorado recently a team of Mexican runners participated in an endurance race wearing footwear of this type.

Case 2: "Yo, I wasn't driving that !"%$&^!! truck, the dead guy yonder was!"

An automobile brake pad was examined and compared to a suspect shoe for a possible impression transfer. Examination requests of this type are received approximately 6 times per year in Spokane. This is the first time in 4 years that an impression has been observed on a brake pad. A distinctive group of ridges was observed on the pad deposited in fine soil. Several 1:1 photographs of the pad were prepared (Kodak Technical Pan film, ASA 25) and compared to exemplar prints from the suspect shoe outsole. Class characteristics similar to the suspect's shoe were present on the brake pad.

Kodak Film Developer Chemicals — Apparent Motive For Homicide

KATHERINE S. WILCOX, OSP COOS BAY.

The victim and his two associates had two boxes of Kodak photography development chemicals in their possession. They had obtained them from a professional photographer's son. The victim had been moving the chemicals around and storing them in different places. Because the trio were looking for a "cook", there was a lot of talk among the crankster community and paranoia was running high.

The suspects thought their chemicals were worth $250,000 - $300,000. When no cook could be found to take the chemicals the suspects apparently decided that their partner was either:

1) A DEA agent (a real slam to the DEA - as if they couldn't come up with a decent methamphetamine cook),
2) A DEA informant, or
3) just a guy trying to rip them off.

So our victim got two bullets in the head and was burnt up along with his new vehicle.

On two previous occasions, while processing methamphetamine labs, I have run across bottles of Kodak film developer.

Roger Ely has written a very nice article on this subject which was published in the *Journal of Forensic Science Society (1990; 30:363-370)*. The reasoning is that Kodak, besides making photography film and film developers, is a manufacturer of fine chemicals. At one time, before restrictions and regulations, Kodak Company sold P-2-P. The idea that Kodak film developer chemicals contain P-2-P (or other chemicals) that can be used to make methamphetamine, persists in the drug community.

Volunteers Needed!

Dr. Barry Logan is the local Coordinator for the American Academy of Forensic Sciences 47th Annual Meeting in Seattle on February 13-18, 1995.

He has asked me to let NWAFS members know that volunteers are needed to assist with registration, ticketing, information booth, audio/visual assistance etc. in conjunction with the meeting. AAFS members and non—members are welcomed as volunteers. Non-members will receive complimentary registration to attend the remainder of the meeting. Each volunteer will be expected to commit four to eight hours during the week to assist with the above duties.

Contact:
Dr. Barry Logan
Washington State Toxicology Laboratory
University of Washington
2203 Airport Way S.
Seattle WA 98134
Tel: (206) 343 5435
Fax: (206) 287 8564

Questioned Document Workshops

AMERICAN ACADEMY OF FORENSIC SCIENCES, SEATTLE, WA
FEBRUARY 13 & 14, 1995

The Questioned Document Reference Database and Typewriter Classification Database Workshop will be held on Monday, February 13, 1995. The Digital Image Processing for Document Examiners Workshop is scheduled for Tuesday, February 14, 1995. Each of the workshop will require advance registration and priority will be given to ABFDE Diplomates, members of the Questioned Document Section of the Academy and of regional forensic science groups.

The instructors are as follows:

Dr. Phil Bouffard, Director of the Lake County, Ohio, Regional Crime Laboratory and developer of the Bouffard Typewriter Classification System.

James F. Larner, Forensic Document Analyst, Immigration & Naturalization Service Forensic Laboratory, McLean, Virginia. Jim has developed the literature reference file portion of the database program.

Robert Muehlberger, Director, Postal Inspection Service Regional Forensic Laboratory, Memphis, Tennessee. Bob assists in the presentation of the typewriter classification portion of the database and has lectured extensively in the subject of the examination, identification and classification of single element typewriters.

Grant Sperry, Forensic Document Examiner, US Postal Inspection Service Memphis, Tennessee. Grant is the computer guru who put all of this together. Grant will also lecture on the use of modems and the new document examiner's bulletin board system.

Frank Hicks, Chief Document Examiner, Mississippi State Crime Laboratory, Jackson, Mississippi. Frank is the chief instructor of the digital image processing portion of the workshops. He has presented papers and lectured on this topic at regional and national forensic science meetings..

Ted Burks, Document Examiner, Mississippi State Crime Laboratory, Jackson, Mississippi. Ted has had considerable practical experience in the use of digital image processing in the document laboratory.

Linda Hart, Forensic Document Examiner in private practice in Miami, Florida. Linda has been using digital image processing in case work for two years. She has written one of the first papers in this subject and has lectured extensively in uses and abuses of digital image processing.

Keith Nelson, Forensic Document Examiner in private practice in Atlanta, Georgia. Keith has recently retired as chief of the document lab for the US Army Crime Laboratory and has considerable experience in the use of digital image processing.

All of the instructors are working document examiners with considerable experience and specialized knowledge in their subject areas. The Academy has leased fifty computers to use in the workshops, so it will be necessary to limit enrollment. Interested parties may contact Lamar Miller at (205) 988-4158. Registration applications will be in the fall newsletter of the American Academy of Forensic Sciences .

Registration forms may also be ordered from:
The American Academy of Forensic Sciences
P. O. Box 669
Colorado Springs, Colorado 80901-0669
(719) 636-1100 FAX (719) 636-1993

ABSTRACT: Digital Image Processing for Document Examiners

Instructors: Frank Hicks, Ted Burks, Linda Hart, and Keith Nelson

Digital image processing is a hot topic in the forensic sciences. This workshop will teach the participants how to use digital image processing in questioned document cases. Using off the shelf software, computers, scanners and printers the document examiner will learn practical imaging techniques. Participants will work at individual computer work stations and will practice on typical questioned document problems. One problem involves the comparison of questioned and known typing samples. The imaging software merges the questioned and known samples and forms an overlay. This overlay graphically demonstrates subtle similarities or differences in alignment or typeface design. This process is also useful in the

examination of traced signatures. Attendees will also practice deciphering obliterated writing and removing bank stamp impressions from check signatures. Participants will also assemble composite charts of questioned and known samples of handwriting for use in court. This software also allows the merging of handwriting samples into lab reports to demonstrate the basis of the examiner's findings. The workshop will also deal with the problems associated with the examination and manipulation of computer generated documents and scanned signatures.

Who should attend this workshop? Document examiners seeking to get their feet digitally wet in the field of image processing. Workshop participants will receive ABFDE recertification credit. This is a day long workshoptaught by experienced document examiners with practical experience in digital image processing

ABSTRACT: Questioned Document Reference Database and Typewriter Classification Database

Instructors: Dr. Philip Bouffard, Jim Larner, Robert Muehlberger and Grant Sperry.

This workshop will last the entire day and is divided into two parts. The first part deals with the databases available to the document examiner in the askSam format. The largest database is the literature reference file assembled by Jim Larner. This program, now known as QDAD-1, contains almost five thousand published and non-published references. Many of these references include an abstract. Workshop participants will be taught how to find a reference and where to locate a hard copy of the article or paper. Other databases are also included. These other database collections include the Peter Tytell Alphabet Soup collection of names and affiliations and the David Crown collection of dot matrix printer information. Information on obtaining the FBI database information on fax machines and photocopy machines will be available to law enforcement document examiners. Each workshop participant will have his own computer and will be given a disk containing all of the databases. It will be necessary to obtain the askSam software program to use the disk back home. However, once again, the nice folks at askSam have agreed to act as a corporate sponsor and will be on hand with special prices for the software program. This workshop will also demonstrate the new document examiner bulletin board system to be used to obtain updates of the database information.

The second half of this workshop teaches the participant how to use the Bouffard typewriter classification system. For the last five years, Dr. Phil Bouffard has worked diligently to develop his computer based classification program to determining the make and model of a typewriter from an examination of the typewritten page. The Bouffard system now allows the document examiner to easily classify typewriters based on the Haas Atlas collection of typewriter specimens. In the older manual typewriter classification systems, each classification choice is dependant on the previous choice. In the Bouffard system, all choices are independent and each choice narrows down the number of possible typewriters. If you have had problems with typewriter classification in the past, this program is an answer to your prayers. Each participant will receive a disk containing the program.

Workshop participants will receive ABFDE recertification credit.

Multidisciplinary Symposium On The Uses Of Forensic Science

AMERICAN ACADEMY OF FORENSIC SCIENCES, SEATTLE, WA
FEBRUARY 14 1995

Purpose: To help focus the attention of law enforcement officers, private investigators, medical examiners, coroners, death investigators, prosecutors, defense attorneys, public and private health and laboratory professionals, and educators on the forensic sciences as potential resources in their own work.

Program: Slide lectures, with handout materials.

Area	Topic	Presenter
Overview	Forensic Science Methods	Jon Nordby, Ph. D.
Criminalistics	Traces and Cases	Vicki Watts, M.S.
Toxicology	Sudafed Tampering	Barry Logan, Ph. D.
Pathology	Custody Deaths	Michael Baden, M.D.
Odontology	A Bite out of Crime	Skip Sperber, D.D.S.
Engineering	Accident Reconstruction	Ira Rimson, PE
Criminalistics	Bloodspatter	Bart Epstein
Anthropology	Identification	Bill Haglund, Ph. D.
Behavioral	Interrogation and scenes	Nancy Slicner, Ph. D.
Documents	Detecting Altered Writng	Shiver Farrell, B.S.
Juriprudence	Science in Court	Carol Hendserson, JD
Summary Case	The Death of Professor Lam*	Sgt. Ronald Buskirk, Ft. Wayne, IN
Session Summary	Closing Remarks	James Adcock

* This topic includes DNA analysis supported by Cellmark.

Contact: Jon Nordby, Final Analysis, (206) 627-2739 or (206) 535-7241

(Editor's Note: I would like to thank Dr. Edward Franzosa, the editor of the Mid-Atlantic Association of Forensic Scientists Newsletter for supplying the abstracts of their annual meeting. I hope you agree that the abstracts are very interesting.)

MAAFS

1994 Annual Meeting
May 5-6, 1994, Virginia Beach
Meeting Abstracts

"Detection of Ecgonine Methyl Ester, Cocaine and Benzoylecgonine in Urine Samples"
Jocelyn Y. Harris, Boyd F. Conley, James W. Jones, and Nicholas T. Lappas

Cocaine use generally is determined by the detection of benzoylecgonine (BE), one of its metabolites, in urine by means of immunoassay presumptive tests and GC/MS confirmatory tests. BE may be produced as a result of the non-enzymatic hydrolysis of cocaine in vivo as well as in vitro in stored urine samples. Ecgonine methyl ester (EME), another cocaine metabolite, is produced in vivo by the action of esterase enzymes but is not formed by the non-enzymatic hydrolysis of cocaine in stored urine samples. Since BE may arise from a source other than in vivo metabolism the Court of Appeals ruled, in US *vs* Mackl, that the detection of BE and the absence of EME, is not sufficient to conclude that cocaine has been used. For this reason we have evaluated urine samples to determine whether the detection of EME is as reliable an indicator of cocaine use as the detection of BE. The presence of cocaine, BE and EME in urine samples was determined by their simultaneous extraction from urine using an adaptation of the TOXI-LAB® extraction tube method, derivatization with BSFTA and detection by GC/MS. In an initial study, EME was detected in only 34 of 40 BE positive urine samples. Thus, it appears that the detection of EME is not as reliable as the detection of BE.

Reference: US Court of Military Appeals (USMJ ART 112a)

The opinions or assertions contained herein are the private views of the authors and are not to be constructed as official or as reflecting the views of the Department of the Army, Department of the Navy or the Department of Defense.

"Analysis of Some Herbal Preparations Used to Fool a Urine Screen"
Robert Llano and Linda Carol Fischer, Virginia Division of Forensic Science

Periodically a drug case is submitted containing capsules of an herbal preparation. Officers generally suspect the presence of controlled substances. However, the word on the street is that these substances are ingested to "cleanse" the body of drugs so that a urine screen will be negative. We will present intelligence information on the subject and analytical data on a few such preparations.

"The Use of Multiple Methods for Cocaine Comparison Analysis"
Richard P. Meyers, J. M. Moore, John F. Casale and Ira S. Lurie, DEA Special Testing and Research Laboratory, McLean, Virginia

Samples from two cocaine cases were recently submitted to this laboratory for cocaine comparison analysis. One case contained two exhibits and the other contained three exhibits. Following microscopic screening, these five exhibits were subjected to rigorous in depth analysis using five different techniques. Capillary gas chromatographic separations using flame ionization detection (CapGC/FID) and electron capture detection (CapGC/ECD) and a high performance liquid chromatographic separation using ultraviolet diode array detection (HPLC/UV) were used to determine the quantitation of the cocaine and various trace level manufacturing impurities and byproducts. Headspace gas chromatography/mass spectrometry (HS/GC/MS) was used to analyze the samples for occluded solvents and gas chromatography/mass spectrometry was used to identify trace levels of phenacetin present in the samples. Data will be presented showing how each analysis corroborated the others and how a positive connection was established between these two cases.

"Stupid DUID Cases"
Randall Edwards, Virginia Division of Forensic Science

The premise of this presentation is that it is stupid and dangerous to drive while under the influence of alcohol and or drugs. Field Sobriety test notes coupled with laboratory test results provide enlightening insights to DUID cases.

"DUID Conviction in the Absence of Measurable Blood THC"
Alex J. Novak, Ph.D., State of New Hampshire Public Health Laboratory

It is not uncommon that lab results come back "negative," in spite of obvious signs of impairment and admission. State vs Brown (N.H. 92-08230) is such a case. The role of toxicologist is highlighted: confirming the probable cause of the arresting officer by matching observed signs of intoxication with expected symptoms; and calling attention to the pharmacokinetics of THC.

"Forensic Analysis of Transdermal Therapeutic Systems"
Yelena Lyudmirsky and Robert R. Sieiner, Virginia Division of Forensic Science

Over the past several years, drug manufacturers have begun placing various products into transdermal therapeutic systems (TTS) - commonly referred to as "patches". Recently, several overdose deaths have occurred due to inappropriate prescription of one of these systems, the Duragesic® TTS. This patch contains fentanyl, a potent narcotic analgesic, which has a high abuse potential. Illicit use of this system is a cause for concern in forensic drug analysis.

This study will discuss the forensic analysis of several TTS systems. Information presented will include the dangers involved with handling the patches, removal of the drug from the matrix material, and analytical details associated with identification via GC/MS and FT-IR.

"ICE: A Southwestern Virginia Investigation"
Chris H.Bryant, Virginia Division of Forensic Science

ICE, like crack, is a different form of a familiar drug. Unlike crack, which is a free base form of cocaine, ICE is methamphetamine in the salt form. ICE is a different crystalline form of the salt, much as rock candy is a different crystalline form of table sugar. ICE is defined as d-methamphetamine hydrochloride in a rock crystalline form. Its appearance is similar to rock candy, rock salt, or quartz rock, all of which have been sold on the street as ICE. The Roanoke laboratory has received several submissions of ICE, believed to be the first in the state. The submissions originated from southwestern Virginia and came in over several months, all part of one investigation. The submissions

consisted of plastic bag corners each containing 2-5 grams of powder and large crystalline chunks. The powders were dissimilar, containing various mixtures of starch, inositol, acetaminophen, and baking soda. The crystalline chunks were identified as d-methamphetamine hydrochloride. Like cocaine free base analyses, ICE samples require supplemental testing. In addition to the standard analytical procedures for methamphetamine, the salt form and the d or l isomer determination is performed. The salt form is determined simply with a FTIR procedure. A flash GC derivatization procedure with optically pure n-Trifluoroacetyl-l-propylchloride (l-TPC) is used to determine the d or l configuration.

"The Growing Problem of Inhalant Abuse"

Donald R. Wilkinson, Delaware State University; Laurel Farrell, Colorado Department of Health; J. Robert Zettl, Colorado Department of Health

Substances such as butyl nitrite (Locker Room), amyl nitrite, and isobutyl nitrite are common inhalants frequently sold in adult book stores. As common as these volatile organic compounds are, other solvents including toluene, freons, and ketones are even more common. Increasingly, young people are apprehended while "under the influence" of alcohol, only to find no alcohol in their breath. Subsequent blood or urine drug screens fail to show any positive drug results. These cases represent other possible cases of inhalant abuse. Many states have changed their drug laws to include volatile chemicals.

This paper deals with reasons for inhalant abuse, source of the chemicals, methods of trapping the solvents in a breath sample, the subsequent analysis of the samples, and a comparison of breath samples with urine samples.

"Development of Selective Gas Chromatography Stationary Phases for Ethanol Analysis"

Rick Morehead, B.S., Restek Corporation, Bellefonte, Pennsylvania

The analysis of specimens for the presence of ethanol and other volatiles is one of the highest volume test in forensic laboratories. High throughput and specificity for ethanol are two critical issues in developing an assay for ethanol. Two new stationary phases have been developed that resolve ethanol from all other commonly encountered volatile substances while maintaining short analysis times.

The presence of ethanol or other intoxicating volatile substances in forensic specimens carries significant legal implications. The identification and quantitation of ethanol should be performed using methods that are specific and sensitive as possible. Gas chromatography has been used as a testing procedure for ethanol in forensic specimens for over two decades. However, analysis of ethanol and other volatile substances using capillary GC is somewhat limited by the inability of any one stationary phase or column to completely resolve ethanol and all of the other commonly occurring volatile compounds.

The retention time of volatile compounds such as alcohols, ketones and aldehydes can be modified by the inclusion of specific functional groups in the stationary phase. By optimizing the percent content of several functional groups in the polymerbackbone of the stationary phase, resolution for ethanol and other closely eluting volatiles can be maximized and overall analysis time can be kept to a minimum.

This paper demonstrates the process of column development as well as the performance of two new stationary phases for the analysis of ethanol in forensic specimens.

"The Faxed Signature"

Jeannette E. Bunch, Virginia Division of Forensic Science, Fairfax, Virginia

Signature stamp cases are rarely received for examination at the Virginia Division of Forensic Science. This particular case involved two suspects who passed checks up and down the East Coast with losses resulting in thousands of dollars. It was determined that the known signature stamps or other stamps produced from the same faxed signature produced the signatures on the questioned checks.

"The Use of the Foster-Freeman VSC-4 in Live Court Room Testimony"

Hartford R. Kittel, Private Examiner, Alexandria, Virginia

Infrared and ultra violet photography has been the primary and most used way of presenting findings concerning differences in inks and other materials in court up until this time. Now, however, one can use a video recorder in conjunction with the Foster-Freeman VSC-1, or its more portable VSC-4, to provide a video presentation to the court. Of course, the alternative suggested by Foster-Freeman, the video printer is also available. Another option for court presentation is a direct examination conducted in open court. Such a presentation took place in Corpus Christi, Texas, on

March 14, 1994, in the court of the Honorable Margarito Garza, Nueces County District Court. Monitors provided to the judge, jury and the attorneys were connected to the VSC-4 and the documents were examined as they watched. The results were graphically displayed and pleased the plaintiff's attorney who opted for a live presentation rather than a video presentation. After two days of deliberation by jury as to damages, a settlement was reached by the parties, giving the plaintiff a substantial, though undisclosed recovery.

"On the Value of Chance Impressions Found on Paper Documents: A Case Report"
Marc Jaskolka, US Naval Criminal Investigative Service Forensic Laboratory, Norfolk, Virginia

Separated documents identified as having been together at one time; conclusion drawn from the analysis of similar chance impressions found on the documents.

"The Great Hefty Caper"
Kirsten S. Jackson, Internal Revenue Service Chief Inspector Forensic Laboratory

Seven 30 gallon garbage bags of shredded paper were submitted to the Chief Inspector Forensic Laboratory with the request to search for, and reconstruct, original tax forms. Methods used to simplify the fracture match examination are discussed.

"Counterfeit Credit Cards - Production Techniques"
Ronald N. Morris and James E. Winand, US Secret Service, Forensic Sciences Division

Counterfeit credit cards are produced using different printing processes and fabrication techniques. The purpose of this paper and presentation is to provide the Document Examiner with information and examples of the different printing processes and fabrication techniques used to make counterfeit credit cards.

"Relative Aging of Ball Pen Ink Writing: Natural Aging vs. Artificial Aging"
Albert H. Lyter III, MS, Federal Forensic Associates, Inc.

The use of relative aging techniques to determine the age of questioned ball pen writing has increased in recent years. More and more situations arise in which known dated writings are unavailable for comparison purposes. A possible alternative to known dated, naturally aged, samples are artificially aged samples. The examination of six different ball pen ink formulations using several different relative aging methodologies is reported. Variables such as batch variations, paper, storage conditions and measurement method were kept constant. A method of artificial aging involving dry heat was used and its effect on entire documents as well as micro samples of ink was evaluated. The results tend to indicate the absence of a consistent trend which is not dependent upon ink formulation and experimental methodology. The evidence suggests that reliability is dependent upon statistically significant sampling, and in some cases is not possible.

"Class Characteristics of Latin American Hand Printing"
Elaine X. Wooton and Nancy N. Berthold, US Immigration and Naturalization Service Forensic Document Laboratory

Through training and casework, the document examiner develops a mental reference collection, and based on a comparison to that collection he categorizes handwriting characteristics as "class" or "individual". The ability to categorize rests substantially on the examiner's previous exposure to like writing; where the writing is from another region of the world, the examiner may require additional outside information. In an effort to develop a small reference collection of Latin American hand printing, over 2500 hand printing samples were collected and analyzed. This paper will highlight the results of our efforts to identify class characteristics prevalent in Latin American hand printing.

"Nigerian Handwriting"
Larry Ziegler, US Immigration and Naturalization Service Forensic Document Laboratory

Some general class characteristics and styles contained within Nigerian handwriting.

"Areas of Computer Examination"
Elizabeth L. James, Federal Bureau of Investigation Laboratory, Washington, DC

Areas of computer evidence spans all criminal violations and can be directly linked to document related evidence. The various violations and specifics to look for; including examples will be discussed.

"Bank Robbery Note File"
Luther M. Senter, Federal Bureau of Investigation Laboratory, Washington, DC

The Bank Robbery Note File (BRNF) is a file of demand notes used in bank robberies in the United States. Notes are coded for searching in an automated system based on phraseology, format, typewriting, handwriting and hand printing styles.

"American Board of Criminalistics Certification Program Update: General Knowledge Examination, Specialty Examinations, Proficiency, Continuing Education"
Richard E. Tontarski, Jr., MFS, President, American Board of Criminalistics

The American Board of Criminalistics (ABC) certification program is nearing completion. A program overview will explain the goals and organization of the ABC. Results from the first series of offerings of the General Knowledge Examination will be reported. Progress on Specialty Examinations development will be presented. How proficiency testing and continuing education for re-certification will be handled will be discussed.

"The Prior History of Paintings by Interpretation of Crack Patterns in the Paint"
Charles S. Tumosa and Marion F. Mecklenburg

In routine forensic practice, the examination of objects for determining prior events can yield information from the patterns of blood, of cracked glass, and of broken plastics. Paintings contain similar information in the patterns of the surface cracks in their paint layers. Cracks are formed in paintings primarily by environmental forces caused by changes in relative humidity and temperature as well as by dynamic forces external to the painting. A computer model was developed to examine these forces and to predict crack patterns under various conditions such as dropping, desiccation, freezing etc. Test paintings were constructed and the crack patterns induced by experiment were compared to the computer model and to the patterns of actual paintings. The source of accidental as well as intentional damage can be inferred particularly with regard to damage in the transportation of paintings and their associated insurance problems. The model is capable of being extended to other composite materials if the mechanical and dimensional behavior of the constituents is known.

"Forensic Laboratory Safety - An Overview of the Occupational Safety and Health and Environmental Regulatory Issues"
James L. Mudd, Quality Assurance and Safety Group (QASG) Program Manager and Marlene Waldrop, R.N., FBI Occupational Safety and Health Manager, Forensic Science Research and Training Center, FBI Academy

With the enactment of the Occupational Safety and Health Administration (OSHA) standards for bloodborne pathogen and chemical hygiene safety, laboratory workers are becoming more aware of safety issues in the workplace. In addition to the OSHA standards, forensic laboratories are also required to comply with various federal and/or state environmental laws and regulations such as the Resource Conservation and Recovery Act (RCRA). This presentation will provide an overview of those OSHA and environmental regulatory programs that directly impact on the forensic laboratory personnel and operations.

"Washington Area Forensic Laboratory Safety Council"
Karen L. Irish, Maryland State Police Crime Laboratory, Pikesville, Maryland

Providing a safe and healthy workplace must be the top priority of all forensic laboratories. Through dedication and cooperation of management and employees, a safety program can be effective in preventing occupational and environmental accidents. The development and implementation of a safety program can be a very time-consuming and difficult process. In addition to OSHA, EPA, NRC, and other federal, state and local agencies adopting regulations which mandate specific health and safety protocols (e.g., Chemical Hygiene Plan, Bloodborne Pathogen Standard and hazardous waste disposal), the forensic laboratory has its own unique problems due to the diversity of evidence and the main-

tenance of the integrity of that evidence. In order to assist each other in developing and implementing health and safety programs, the Safety Officers of forensic laboratories in the Maryland, Virginia and Washington areas formed the Washington Area Forensic Laboratory Safety Council. The objectives and format of this council, as well as MAAFS's support, will be discussed.

"Daubert: Has The Supreme Court Bitten Off More Than It Can Chew?"
Walter F. Rowe, Ph.D., Department of Forensic Sciences, George Washington University

The United States Supreme Court in its decision Daubert et al. v Merrell Dow Pharmaceuticals, Inc. has held that the Frye standard was abrogated by enactment of the Federal Rules of Evidence. In place of the general acceptability criterion of the Frye Rule, the majority opinion laid out several criteria to be met by novel scientific evidence: (1) whether the theory or technique can be and has been tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) what is known about known or potential rates of error; and (4) whether the theory or technical enjoys general acceptability within a particular scientific community. This paper will review the key philosophical concepts underlying first criterion, especially Karl Popper's concept of "falsifiability ". The paper will also discuss whether or not the four criteria proposed for evaluating novel scientific evidence constitute safeguards against the admission of testimony based on pseudoscience.

"York College of Pennsylvania's Criminalistics Program Four Years Later"
Sherry T. Brown, York College of Pennsylvania

York College of Pennsylvania introduced a major in Physical Science with a concentration in criminalistics in the fall of 1989. The program is now seeing its first graduates. The program had a slow start partially due to slow advertisement and partially due to the lack of teaching faculty with this expertise. The lack of support from other related departments and administration was a factor in the growth and progress of the program. Factors influencing the slow progress of the program and factors hindering its growth will be discussed. These include funding for both teaching time and equipment, advising new majors in criminalistics, teaching responsibilities and coordinator responsibilities, and student factors.

"Cease Fire: Drawing a Line in the Sand"
Richard E. Tontarski, Jr., MFS, Bureau of Alcohol, Tobacco and Firearms, Forensic Science Laboratory, Rockville, Maryland

Technology for the automated scanning, digitization and computer storage/retrieval of fingerprints is well established. Although posing special problems as a result of geometry, fired bullets have potential for automated examination and information storage for subsequent retrieval. A system is being acquired which will scan a fired bullet and digitize information from the microscope examination of striae on the bullet. The digitized information will provide a characteristic "signature" of the firearm from which the bullet was discharged. Once obtained, the "signature" information can be rapidly compared to a database of bullets from test firings, homicides and other shooting cases. A program is planned to test the computer-based bullet identification system using evidence collected in shooting incidents from two cities. If successful in reducing examiner analysis time and improving the number of "hits" in bullet matching, the system will be expanded to other cities in following years.

"Detection of Smokeless Powder Residue by Micellar Electrokenetic Electrophoresis"
Kelly D. Smith, William A. MacCrehan, National Institute of Standards and Technology; Walter F. Rowe and David W. Baker, The George Washington University

Micellar electrokinetic capillary electrophoresis (MECE) offers a new analytical method for the detection of the organic constituents of smokeless powder residue. Previous work at the National Institute of Standards and Technology has demonstrated the applicability of the MECE technique to tape lifts of gunshot residue off the hands of shooters. Present research has focused on the application of the MECE technology to gunshot residue on clothing and on the development of new sampling methods.

The effect of possible interferences from blood, grease, and body oils has been investigated. Targets previously treated with Griess and sodium rhodizonate reagents were sampled to determine if the MECE technique could be used in conjunction with common gunshot residue tests. A shooting study evaluated the effectiveness of vacuuming residue samples off the hands of shooters. Smokeless powder is a common deflagrant used in pipe bombs. Residue samples from post-blast fragments of several pipe bombs were analyzed by the MECE technique.

"Comparison of Dyed Questioned Fibers by Comparison Microscopy and Microspectrophotometry"
Edward G. Bartick and Rena A. Merrill, Forensic Science Research and Training Center, FBI Academy

Color is a very important aspect in the comparison of single fibers found as evidence. Shades of dyes on single fibers are sometimes difficult to distinguish by eye even with good comparison microscopes. Colors can look the same even when different dyes are used to produce a given color. Therefore, the use of visible microspectroscopy, which provides band intensity differences from shades and spectral frequency variations from different dyes, has been very useful in the forensic comparison of questioned and known fibers. The following paper describes a visible microspectroscopic study on the discrimination of fiber color shades where darker shades are produced by increasing the concentration of dye substance. This paper describes a study of comparing single fibers which possibly have different dye substance used to produce a similar color. An evaluation is made on the application of visual comparison microscopy and the ranges of ultraviolet and visible microspectrophotometry for closely colored single fibers.

"The Comparison of Single Fibers of Different Color Shades Using Visible Microspectrophotometry"
Rena A. Merrill and Edward G. Bartick, Forensic Science Research and Training Center, FBI Academy, Quantico, Virginia

The ability to discriminate variations in lightness or shade among fiber evidence of the same hue or color group is important to the forensic examiner. Several sets of fibers consisting of a range of shades were analyzed by visible microspectrophotometry. The resulting visible spectra were examined along with the calculated colorimetry values in an effort to identify the best method to differentiate between fibers of different shades. Replicate spectra were averaged and both the mean and standard deviations were calculated for each fiber sample. Cluster diagrams were used to plot and examine the chromaticity coordinates.

"Biodeterioration of Natural Fibers: Three Case Studies"
Walter F. Rowe, Ph.D., Department of Forensic Sciences, The George Washington University

Natural Fibers are normally identified by means of light microscopy. This paper describes the alterations in microscopic morphology produced in cotton, wool and human hair by various environmental conditions, such as burial and prolonged immersion in water. Three cases to be discussed are: (1) cotton fibers recovered from the clothing of a body that had been buried eight years, (2) wool fibers from cloth fragments found on a US Coast Guard submarine chaser that sank in 1943, and (3) human hairs from the St. Mary's City Lead Coffin Project.

"New Uses For Old Insects - What the Insects Can Do For You"
Theodore W. Suman, Science Division, Anne Arundel Community College

The role of insects in death investigations, drug usage, and toxin analyzed. An update on the status of national board certification will be included.

"Going to the Dogs: The Laboratory's Role in Training the Accelerant Detection Canine"
Eileen A. Davis, Virginia Division of Forensic Science, Fairfax, Virginia

Canines have traditionally been thought of as tools for searching for drugs, explosives and missing persons (living or dead). In this instance we look at canines as a tool in accelerant detection. The talk will review the development of canine programs from the first ATF/Connecticut State Police pilot program to the Canine Accelerant Detection Association (CADA) which is in its second year of existence. The Laboratory's role will be addressed and benefits to the laboratory as well as benefits to the canine/handler team will be discussed. Specific examples will be given with respect to involvement of the Virginia Division of Forensic Science, Northern Laboratory and the three canine/handler teams that are in this geographical area.

"Forensic Science Pieces Together the Clues of a Murder"
Susan M. Ballou, Montgomery County Crime Lab, Forensic Science Division, Rockville, Maryland

Forensic science techniques are critical in solving most criminal homicide investigations. The unique skill and expertise of the Forensic Scientist is greatly tested with the absence of a physical body and no eyewitnesses to the commission of the crime. In October of 1992 a report of a missing woman was filed with the Montgomery County Police Department of Maryland. In the ensuing days it became apparent this was not just a missing person case when a

bloody pillow and pillowcase were recovered from a wooded area not far from the missing woman's home. Careful examination of the pillowcase revealed fragments of a bloody fingerprint and bloody patterns that seemed to indicate the type of weapon used. A thorough search of the woman's bedroom resulted in the recovery of three small blood stains, a wig fiber and a head hair. Although the body of the victim was not recovered during the investigation, the evidence collected and techniques used by the forensic investigators resulted in a guilty plea to second degree murder.

"Separation of Spermatozoa from Vaginal Epithelial Cells in Sexual Assault Evidence"

Jian Chen M.D., and Lawrence Kobilinsky Ph.D., John Jay College of Criminal Justice, C.U.N.Y. New York, N.Y. and Dora Wolosin Ph.D., Robert Shaler Ph.D. and Howard Baum Ph.D., Office of the Chief Medical Examiner, New York, N.Y.

The analysis of genetic markers for the purpose of individualization of semen specimens is extremely important in cases of sexual abuse and assault. The serological analysis of sexual assault evidence can sometimes be complicated because stains are often composed of a mixture of spermatozoa and vaginal epithelial cells. A filtration method has been developed to cleanly separate spermatozoa from epithelial cells based upon differences in size and shape. Nylon mesh filter of the appropriate pore size can be used to separate the smaller spermatozoal cells from the larger epithelial cells. The former pass freely through the membrane while the latter are retained on the filter. In this study, cell separation was demonstrated by (a) microscopic observation of stained cells, (b) counting of fluorochrome stained cells, (c) amplified fragment length polymorphism analysis of DNA obtained from separated cells. The results of these analyses indicate that (1) approximately 70% of spermatozoa in the mixed cell sample will pass the 10 mm filter, (2) only about 1-2% of intact epithelial cell will do so, and (3) that a small number of nuclei from spontaneously lysed epithelial cells will pass through the pores of the filter. Experimental results using mixtures of spermatozoa and vaginal epithelial cells in different ratios support the conclusion that the filtration process is an efficient and reliable method to separate spermatozoa from epithelial cells in casework specimens for subsequent DNA analysis.

Supported under award #94-IJ-CX-0002 from the National Institute of Justice, Office of Justice Programs, US Department of Justice. Points of view in this paper are those of the authors and do not represent the official position of the US Department of Justice.

"Intentional Destruction of Evidence by Suspects in Rape Cases - One Serologist's Casual Observations"

Lisa C. Schiermeier, M.S., Virginia Division of Forensic Science

Deoxyribonucleic acid (DNA) is the genetic information that determines individual characteristics and is found in all nucleated cells. The development of methods to extract DNA from virtually all biological specimens has greatly expanded the potential for individual identification. In rape cases, there is usually an exchange of evidence between victim and suspect. In order to perform DNA analysis, this evidence must be in the form of a biological fluid (seminal fluid, vaginal fluid, blood or saliva), hairs, and/or tissue.

State prosecutors agree that the number of rape-turned-consent cases has increased due to the high discrimination potential of DNA analysis. Simultaneously, the cases In which the suspect has tried to eliminate the evidence have also increased. Fortunately, the suspects have not been too successful which allows the Serology/DNA Section to conduct a complete serological examination on the evidence. Case studies, to include scenarios, methods of destruction, conventional serology and DNA results, and trial outcomes will be presented.

"Forensic and Clinical Applications of PCR-Based Technologies"

R.A. Guerrieri, M.T. Eisenberg, and J.M. Mason, Roche Biomedical Laboratories, Inc.

In recent years the polymerase chain reaction (PCR) has become an invaluable research tool for the development of genetic tests in the clinical and forensic disciplines. The incorporation of newly developed testing procedures for both areas of application requires a conservative yet dynamic approach. The objective of this discussion is to initially focus upon the validation and implementation processes associated with a technology transfer from the research to operations laboratory. This includes an examination of operational parameters of specific importance, such as quality control, analysis effectiveness, and testing efficiency. A second and most significant aspect of discussion is to evaluate such incorporated PCR methodologies (DQ alpha, D1S80, HUMTH01, SE33, D17S5, and Amplitype PM) in regards to performance and success levels on actual casework samples. To address this issue, a detailed description of casework experiences over the past year will be discussed within the three (3) primary categories of forensic importance: criminal investigations, parentage evaluations, and specimen identification.

"DNA Artifacts"
Hal Deadman, FBI Laboratory Washington, DC

The National Research Council's (NRC) report "DNA Technology in Forensic Science" has generated considerable controversy in the field of forensic DNA analysis and has set forth recommendations that the NRC believes will improve DNA analysis used for forensic purposes. Much of the controversy has centered around the justification and validity of the NRC recommended ceiling principle and interim modified ceiling principle methodologies presented in chapter three for assessing the frequency of the DNA profiles obtained in a case. There has been much less discussion about the NRC recommendations in chapter two on the technical aspects of generating DNA profiles. The NRC, however, does make some recommendations in chapter two that can impact on the weight given to DNA evidence in the courtroom. For example, the NRC report requires that "each DNA typing method must be rigorously characterized with respect to the types of possible artifacts, the conditions under which they are likely to occur, the scientific controls for detecting their occurrence, and the steps to be taken when they occur."

An example of an artifact is what the NRC calls "anomalous bands", and in chapter two they present a decision tree for one to follow in the interpretation of cases where these "anomalous bands" are present. In almost all cases, the presence of artifacts result in the evidence being inconclusive with respect to matching. It is often the case, however, that the type of artifact has been repeatedly seen in the laboratory and can be easily explained. These situations should not necessarily result in inconclusive findings. In addition, there are also many defense experts that will utilize any result short of perfection (and autorads are never perfect) to argue that the results in a case are a basis for an exclusion (not an inconclusive) when the DNA testing laboratory has made a probative match.

Because of the above, when artifacts occur, it is important that the forensic scientist be familiar with them. My presentation will discuss the types of artifacts that can occur, the causes for their occurrence and procedures in the FBI Laboratory for interpreting cases containing artifacts. The areas addressed will include: (a) extra bands, (b) missing bands, (c) band shifts, and (d) measurement error.

"Case Studies - HLA DQα"
Barbara E. Llewellyn, M.S., Virginia Division of Forensic Science

The polymerase chain reaction is an in vitro method for producing large amounts of a specific DNA fragment of defined length and sequence from a small amount of a complex template. Since its introduction in 1985, the polymerase chain reaction has transformed the way DNA analysis is carried out in all areas of molecular biology, including forensic science. The method provides a sensitive means of analyzing DNA sequences and has proven to be a useful tool for analyzing DNA extracted from biological evidence. The AmpliType HLA DQα Forensic DNA Amplification and Typing Kit (Roche Molecular System, Inc., Branchburg, New Jersey) was first utilized in forensic casework at the Virginia Division of Forensic Science, in July of 1993. As of January 1, 1994, 63 cases had been received for analysis and 43 had been completed. This method has made it possible to obtain results that could not have been obtained through conventional serological typing techniques or DNA RFLP analysis. An overview of several cases will be presented where conventional serological results were inconclusive or not obtained and there was insufficient or degraded biological material for DNA RFLP analysis, but HLA DQa results were able to eliminate or include the suspect.

"Validation of Short Tandem Repeat Typing for Forensic Use"
Catherine Theisen Comey, Ph.D., Forensic Science Research and Training Center, FBI Academy

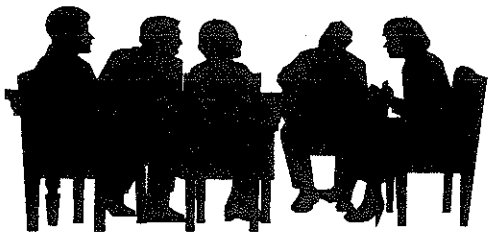
Short Tandem Repeats (STRs) are DNA sequences consist of 3-5 base pair (bp) repeats. Several factors make STRs potentially useful for analysis of biological evidence: (1) they are quite polymorphic in the human population; (2) the relatively small allele size (less than 300 bp) make them amenable to rapid analysis by amplification using the polymerase chain reaction; and (3) the small allele size makes them useful for analyzing even partially degraded DNA. Before STR analysis can be implemented in a case working laboratory, it must be validated to demonstrate its reliability and robustness. The FBI Laboratory is undertaking a series of studies to establish the effectiveness of STR typing. Fourteen loci have been examined, either separately or as a part of a "multiplex" kit in which three loci are amplified and analyzed simultaneously. Experiments involving amplification conditions, analytical gel conditions (native versus denaturing polyacrylamide gels), DNA extraction methods, and DNA mixing will be discussed, as well as allele frequency data in various population groups.

"The Implementation of Amplitype PM (Polymarker) and D1 S80 into Forensic Casework"
Lawrence A. Presley, Jenifer A. Lindsey and Valerie Ladner; Federal Bureau of Investigation Laboratory

The implementation of Amplitype PM (Polymarker) and D1S80 into forensic casework requires validation, population and casework studies and the development of appropriate protocols based on research and casework studies. Amplitype PM, a dot blot detection method, and D1S80, an electrophoretic detection method, have inherent issues involved in their application which need to be explored as the systems are incorporated into routine forensic casework. Quality control measures also need to be developed with accompanying documentation. This presentation will provide and overview of the implementation process and highlight some of the areas which may be important to the successful forensic application of these DNA typing methods.

"Virginia Division of Forensic Science DNA Data Bank Hit: Virginia's First Interlaboratory 'Cold Hit'"
David A. Pomposini and Jeff Ban, Virginia Division of Forensic Science

In January of 1993, an elderly woman was robbed, beaten and raped in her residence by an unknown assailant. The suspect had broken through a rear sliding door glass at about 4:00 a.m. and assaulted the victim, raped her and attempted sodomy. The beating was so brutal that the victim lost several teeth and suffered broken ribs. The suspect had made it clear to the victim that he would not leave any clues to tie the crime to him, thus he took extensive measures to make sure he removed any fingerprints or other evidence that he might have left. The victim did not see her assailant and authorities had no good suspects or leads. The forensic serologist in the Northern Laboratory (Fairfax, VA) processed the various items of evidence submitted in the case, and transferred to the Tidewater DNA section a seminal fluid stain found on the victim's sweat jacket along with a known sample of blood from the victim. A foreign RFLP pattern was obtained from the sweat jacket stain at the genetic loci D1S7, D2S44, D4S139, and D1OS28. The foreign profile was searched against the Virginia DNA Data Bank at the genetic locus D1OS28. The results of this search, the set up of the Virginia DNA Data Bank, and the comparison of the RFLP pattern to the suspect will be presented.



Meetings And Training Opportunities

1. The 20th Annual Meeting of the Northeastern Association of Forensic Scientists will be held October 13-15, 1994, at the East Side Marriott Hotel, New York, NY.
   Contact:
   Jeffrey H. Luber
   Suffolk County Crime Lab
   Suffolk County Office Building #487
   Hauppauge NY 11787
   (516) 853-5585.

2. The 1994 Midwestern Association of Forensic Scientists Annual Fall Meeting will be held October 11-15, 1994 at the Cleveland South Hilton Inn in Cleveland, OH. A room rate (single or double) has been established at $79.00 per night.
   Contact:
   Mary Wenderoth or Cathy Denissoff
   Cleveland Police Dept.
   1300 Ontario St
   Cleveland OH 44113
   (216) 623-5646 or 623-5648

3. The California Association of Criminalists and the Forensic Science Society will be holding their first ever joint meeting October 19-22, 1994, at the Holiday Inn, Pasadena, CA.
   Contact:
   Steve Dowell
   Los Angeles County Department of Coroner
   1104 No. Mission Road
   Los Angeles CA 90033
   (213) 343-0530

4. The Southwestern Association of Forensic Scientists will be holding its Fall 1994 training seminar November 15-19, 1994, at the Adam's Mark Hotel in Houston, Texas.
   Proposed workshops include explosives, microcrystalline drug identification, stress management, PCR, basic firearms identification, pyrolysis GCMS of trace evidence, HPLC analysis of drugs and explosives, FTIR analysis of fibers, advanced forensic photography, Polaroid phptography, alcohol testing for transportation industry workers, capillary GC troubleshooting, courtroom testimony, gene sequencing, glass fractures, ELISA and mass spectral identification.
   Contact:
   Pauline Louie
   Houston PD, Crime Lab
   33 Artesian, Rm. 326
   Houston TX 77002-1505
   (713) 247-5449

THE BACKPAGE

Weird Revisited

As I write this, it is a warm August day in Seattle. The sort of day that editors look for "Man bites Dog" stories. The Kingdome is falling down, the Public Safety Building in which I work will be torn down in a few years assuming an earthquake doesn't do it for us sooner, Public Health Care has become the biggest bore since the Revolution. Is there any relief in sight? Yes!

People have now actually heard of Forensic Scientists. For those of you who have neglected to memorize my writings on the subject, I take you back to December 1993.

"What do you do?"

"I'm a Forensic Scientist."

"A Rocket Scientist!

"No, a Forensic Scientist."

"That must be really interesting. Do you cut up dead bodies?"

"I'm sorry, no."

"What do you do then?"

"I work in the Crime Lab."

"Wow, do you mean like Quincy?"

Post O.J. Simpson, this conversation might go like this.

"What do you do?"

"I'm a Forensic Scientist."

"Ah, I'm glad I ran in to you. I have some questions I hope you can help me with.

What's the difference between RFLP and PCR? Why do you need 72 hairs to compare people's hair? How many foot pounds/ergs/newtons would it take to cut someone's throat using a 12" blade?"

"Well RFLP and PCR are methods—"

"Before you explain I have a theory of whodunit it. It was really Elvis. You see he found out that his daughter had secretly married Michael Jackson. Elvis thought she was going to marry Michael Jackson's chimpanzee but when he finds out that Marie has dumped the chimp in favor of Michael, Elvis decides to drive to Michael's place and kill him.

"While waiting at Hertz for his rental car, he meets O.J. Simpson, who's there to make a commercial.

"Hi Homer!

"The name's O.J!

"O.J? No man, I had a gallon of Dr. Pepper, 24 Big Macs and 257 Valium ten minutes ago, but I'll take a bucket of Chicken wings if you have them.

"Anyway O.J. and The King get to talking about faithless women and the weirdoes they consort with.

"O.J. says he's having problems with his wife and Elvis says - I'm going to L.A. to take care of some singer called Jesse Jackson who's married my daughter, why don't I blast your wife when I'm down there? At least 436 people will testify that I was spotted in 29 separate states at the time of the murders.

"I can get you a Ford Escort for £23.85 a-day with unlimited mileage, says The Juice.

"It's a deal man.

"Now what do you think of that Mr. Clever Forensic Scientist?

"You know I bet I would make a good Forensic Scientist."

"Jeez, you know the public is still weird!"

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DNA Fingerprinting?

The Seattle Crime Lab received a "Request for Examination" recently asking for the following analysis to be performed,

"D.N.A. test on blood on weapon to compare with victim's latent impressions, if any, amido black process."

Terry McAdam