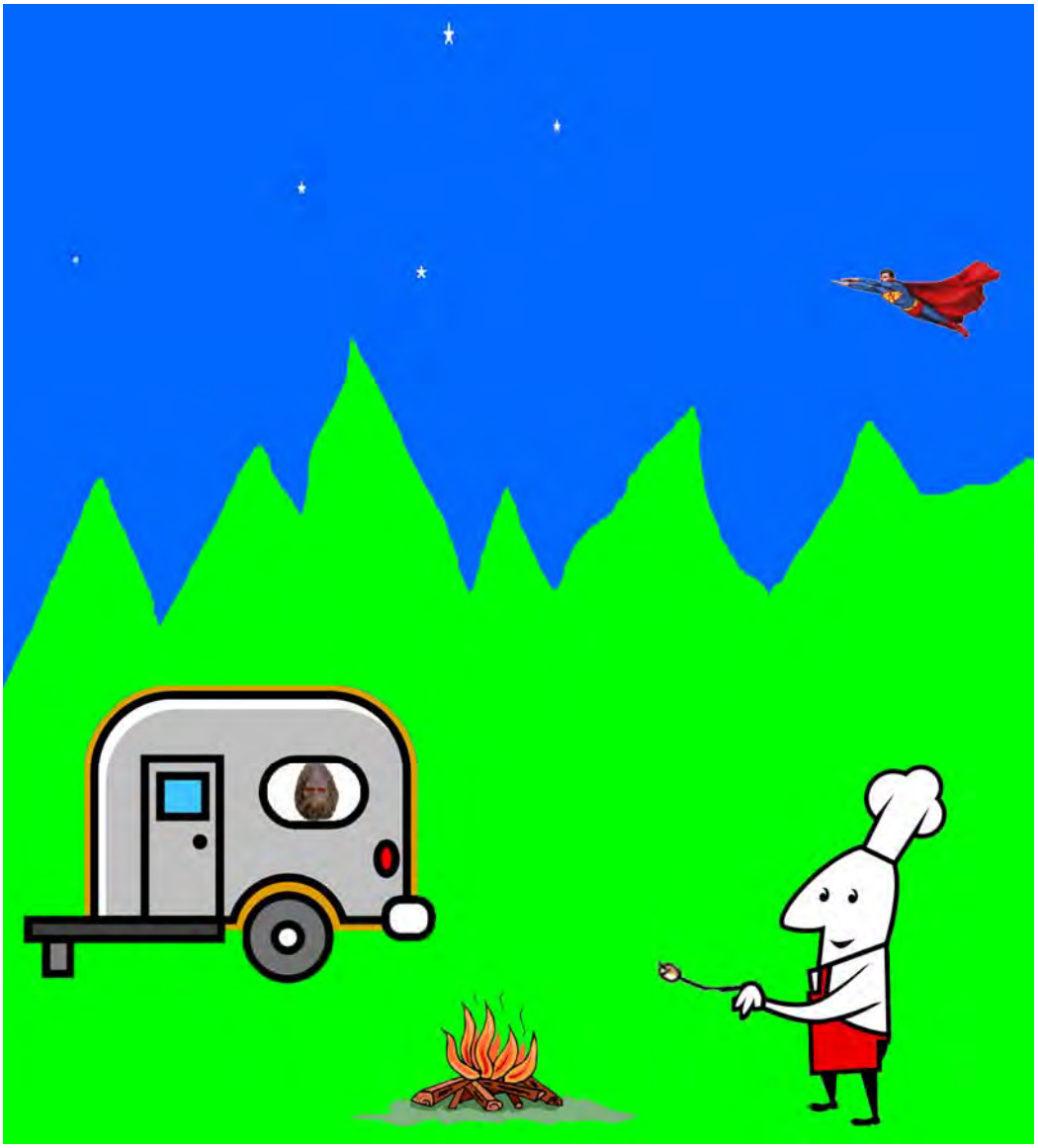
Crime Scene

Summer 2012 Volume 38, Issue 3

Things are starting to heat up for our 40th Anniversary!



Editor's Message

Well, summer is upon on! After a seemingly very long wait for it to get here - it is finally upon us. Which also means that the year is already 1/2 over, and I am left to think "where did the time go?" I wonder if it is just me thinking this or if there are others out there with similar thoughts?

Being in the northwest with our dark, wet winters, summer is a time that we all love. For a lot of us, summer brings us barbeques, outdoor activities and vacations. With all of this going on, try not to get too tired with fitting all of your summer activities in. And, I certainly hope that all of our members have a safe and joyous summer.

This edition is my, and the Publication's Committee, largest publication to date and it brings us another article from Jeff Teitelbaum along with 3 peer reviewed technical submissions of various forensic topics. One of these submissions originated from our special research topics from our Tacoma meeting. In addition there is more information about our upcoming meeting and another Supreme Court ruling involving the Confrontation Clause - Williams *v*. Illinois.

Lastly, make sure you start making plans early for our 40th anniversary as this will be another great opportunity for all. Hopefully you have seen the success that the NWAFS has already had this year and it seems to be only getting better. So be part of it of our organization by participating by dropping me an idea, comment or just attending our Missoula celebration...it will be a time to celebrate!

Thank you and enjoy the rest of your summer!

Jeff Jagmin

About the Newsletter...

Crime Scene is the official publication of the Northwest Association of Forensic Scientists. It is published 4 times a year in the months of January, April, July, and October. The Newsletter welcomes submissions from its membership such as technical tips, case studies, literature compilations, workshop or training notifications, reference citations, commentary, historical accounts, and other topics of interest to the membership. The views expressed in articles contained in this publication do not necessarily represent the views of the Northwest Association of Forensic Scientists. The Association neither guarantees, warrants, nor endorses these views or techniques but offers these articles as information to the membership.

Please submit material for publication in Microsoft Word for Windows format as an e-mail attachment or on compact disk (CD). All technical material will be subject to peer review by NWAFS members. Requests for permission of any material contained in this newsletter may be addressed to the editor. Requests, or questions, of technical submissions will be directed to the originating author. For more information regarding the Newsletter contact:

Jeff Jagmin (editor)
Washington State Patrol Crime Laboratory
Jeff.Jagmin@wsp.wa.gov or editor@nwafs.org

NWAFS Crime Scene TABLE OF CONTENTS

NWAFS OFFICERS for 2011 - 2012

Executive Committee

President	Matt Noedel Noedel Scientific MNoedel@att.net
Vice-President	Chris Hamburg Oregon State Police Chris.Hamburg@state.or.us
Member-at-Large	Kathy Kittell Oregon State Police Kathleen.Kittell@state.or.us

Secretaries

Membership	Corinna Owsley Idaho State Police Corinna.Owsley@isp.idaho.gov
Secretary-Treasurer	Heather Campbell Idaho State Police Heather.Campbell@isp.idaho.gov
Technical	Trevor Allen Washington State Patrol Trevor.Allen@wsp.wa.gov
Editorial	Jeff Jagmin Washington State Patrol Jeff.Jagmin@wsp.wa.gov

PRESIDENT'S MESSAGE

Summer 2012

The summer is here in the Northwest and that means that the annual conference is just around the corner. We can be sure that the meeting in Missoula will be unforgettable as your Board continues to implement the requirements for a successful program. We need your help though in getting the word out to all those who have a forensic application to their work—the crime scene processors, local law enforcement, Prosecution and Defense Attorneys and academics.

To help spread the word of our training conference, Jeff Jagmin, the Editor of NWAFS's publication ***Crime Scene*** has produced three documents announcing the upcoming meeting in Missoula. First, we have a full color tri-fold flyer that describes both the NWAFS and the Missoula program. Next we have a number of one page descriptive announcements with the bare bone facts about the training. Finally, we have an 8 page full description (like what is offered in the NWAFS publication) that includes the registration forms, full course descriptions and Research Workshop proposals.

> ***Please contact myself or Jeff Jagmin if you would like some of these promotional announcements to leave on your front office counter, to post with your local law enforcement training coordinator or provide to your local attorneys.***

Our organization survives solely on the backs of the membership. Maintaining the NWAFS as a premier regional organization does not happen by accident. If you don't know we exist, you won't attend our training and we live and die by the validity of and participation in our conferences. Let's show the Northwest forensic community what we have to offer and make sure that everyone who can benefit from our training does so. As a member, we rely heavily on you to get the word out to your local support networks that we are having a conference in Missoula and expanding our exposure!

Lastly, I want to emphasize our unique opportunity to get published. In Missoula, as we did last year in Tacoma, we'll be offering three research projects whereby the participants will conduct basic research, present the project concepts during the conference and ultimately publishing the data in ***Crime Scene***. Look for this inventive approach to training in the conference section of this issue.

NWAFS Missoula Training Conference
Holiday Inn Downtown
September 24-28, 2012

Matthew Noedel, President NWAFS
mnoedel@att.net
253-227-5880

Asked & Answered

Search tips from a forensic library

Jeff Teitelbaum, MLIS | Forensic Library Services
Washington State Patrol / Seattle Washington

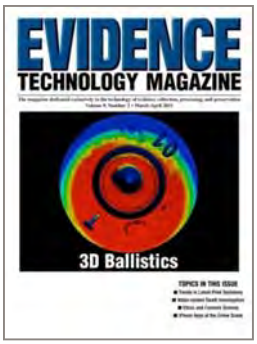
Free Forensic Science Publications

There are quite a number of quality forensic-related publications available at no cost. Given the current economy, and given the budgets of most crime labs in any economy, it is nice to have some decent resources that do not require subscription costs.

Please find below a list of some of these titles. Each publication is linked to its website, and I've provided a short description of the material. Some of the publications allow you to enter your email so that you'll receive notifications of new issues. If they don't, you can set up a RSS feed so that you'll be alerted to new content. Or, if you'd prefer, send me an email and I'll add your name to my list of publications alerts and reports that I regularly send out.

Criminalistics

Evidence Technology Magazine

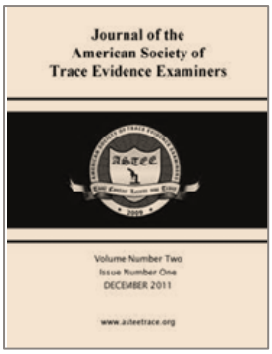


Begun in 2003, **Evidence Technology Magazine** is a commercial trade publication that focuses on evidence collection, processing, and preservation. It is published 6 times per year and requires an initial registration (free) in order to receive the digital magazine.

Journal of Bloodstain Pattern Analysis

The **Journal of Bloodstain Pattern Analysis** is the official publication of the International Association of Bloodstain Pattern Analysts. Each issue generally features at least two technical articles. The journal is published quarterly and all issues from 2000-present are available on their website.

Journal of the American Society of Trace Evidence Examiners



The **Journal of the American Society of Trace Evidence Examiners** is published twice a year. It launched in 2010, so there are only a few issues available, but the journal consists almost entirely of technical articles and is well worth a look.

Drugs/Chemistry

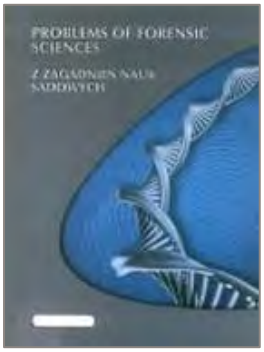
Microgram Bulletin

The **Microgram Bulletin** is published monthly by the U.S. Drug Enforcement Administration. It provides up-to-date content of interest to the forensic community including Drug Scheduling Updates, Literature references, meeting Announcements, and Training Opportunities. Issues from 2003-present are available.

Microgram Journal

The **Microgram Journal** is a compilation of forensic chemistry articles often written by DEA scientists. Individual articles are added through the year at irregular intervals, and all articles are compiled into a PDF at year's end. Articles are available from 2003-present.

Problems of Forensic Science



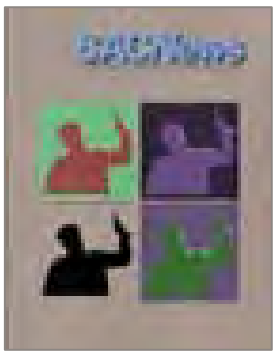
Problems of Forensic Science is a quarterly, peer-reviewed journal that has been published in Poland since 1960. The articles cover all aspects of forensic science, and all articles from 1997-present are available on their website.

Newsletters

Academy News

Academy News is the bi-monthly newsletter of the American Academy of Forensic Sciences. The newsletter rarely presents any technical material; it is more to keep up with events of the academy.

CAC News



CAC News is the quarterly newsletter of the California Association of Criminalists. There are generally several high-quality technical articles in each issue, and all issues from 1971-present are available on their website.

ToxTalk

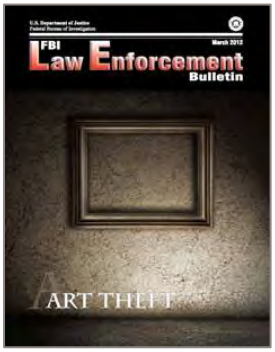
ToxTalk is the quarterly newsletter of the Society of Forensic Toxicologists. There is generally quite a lot of information regarding new drug compounds and specific casework examples. All issues from 1977-present are available on their website.

General

American Laboratory

American Laboratory is an ad-supported monthly magazine that features quality articles pertaining to modern labs, statistics, methodologies, etc. It is published 6 times per year and requires an initial registration (free) in order to receive the digital magazine.

FBI Law Enforcement Bulletin



The **FBI Law Enforcement Bulletin** is published monthly by the Federal Bureau of Investigation and features stories on a variety of FBI and forensic-related issues. All bulletins from 1999-present are available on their website.

Forensic magazine

Forensic Magazine is an ad-supported bi-monthly magazine that focuses on current developments in the forensic sciences. You can find useful information in the magazine, although it often seems to focus on forensic sciences lite.

Lab Manager

Lab Manager is an ad-supported monthly magazine that features relevant articles on laboratory technology and management.

NIJ Journal

The **NIJ Journal** is published three times per year by the National Institute of Justice and features articles on law enforcement and forensic science topics. Issues from 1994-present are available on their website.

There is a lot of high quality material in these publications, belying the notion that worthwhile scientific literature can only be found in the high profile (and high cost) subscription journals. Many respected authors publish in these publications, and there is definitely an ongoing trend towards the open access publishing model. In these times of economic stress, forensic scientists should avail themselves of these freely available resources.

Jeff Teitelbaum
June 12, 2012

To subscribe to my email alerts: send a note to Jeff.Teitelbaum@wsp.wa.gov

Technical Article

A Comparison of the QuEChERS Method to Common Forensic Laboratory Methods of Extraction for GC/MS Analysis of Controlled Substances in Complex Matrices

Trevor Allen,[1*] *B.S., Quinton R. Beedle*[2]

[1]Washington State Patrol, Crime Laboratory Division, Cheney, WA
[2]Eastern Washington University, Department of Chemistry, Cheney, WA

ABSTRACT: QuEChERS is a quick and simple method of extraction for a wide variety of complex matrices. This extraction method was tested on various controlled substance evidence samples using a GC/MS. The goal was to determine the overall efficiency of the QuEChERS method in comparison to common forensic laboratory extraction methods currently used. It was found that the use of QuEChERS can produce comparable results with a lower number of co-extractives, while reducing consumable materials, sample preparation time and reducing the need for instrument maintenance after samples have been run.

KEYWORDS: QuEChERS, matrices, extraction methods, forensic science, controlled substance, gas chromatography-mass spectrometry (GC/MS)

Current extraction methods of controlled substances in complex matrices are a subject of concern for many forensic science laboratories. Samples that pose a particular difficulty include hallucinogens in candy/chocolate concoctions, marijuana in baked goods, and drugs of abuse in infant formula. The co-extractive compounds associated with these matrices (fats, cholesterols, sugars and botanicals) tend to carry through with the target analytes when common extractions are employed. The limitations of these common methods of extraction are numerous—lengthy processes, large amounts of consumable materials required, as well as the potential for instrument strain and maintenance.

The possibility of addressing this issue comes in the application of the QuEChERS (Quick, Easy, Cheap, Effective, Rugged and Safe) method of extraction. The original use of this particular method was to isolate pesticides from produce samples for analysis [1, 4-9]. Employing the QuEChERS method to extract controlled substances in evidence where there is significant matrix interference will help clean up these extraction processes.

The normal process for QuEChERS is accomplished in two steps. This process first involves extracting/partitioning the homogenized sample using an aqueous salt solution and an organic solvent. The supernatant may be further cleaned using a dispersive solid phase extraction (dSPE) technique to remove sugars, lipids, organic acids, sterols, proteins, pigment, and excess water [1].

The simplicity and speed of this process could offer forensic laboratories an alternative to traditional liquid-liquid and solid phase extractions. This application note demonstrates the benefits of using the QuEChERS method over some common extractions utilized today as a way to isolate controlled substances from complex matrices for instrumental analysis.

Experimental

Materials

Controlled substances were obtained through the Washington State Patrol Crime Laboratory Division, and were used as received. A kit containing QuEChERS extraction salts and dSPE cleanup vials was obtained through Restek Corporation (Table 1). All solvents were ordered through Fisher Scientific and were used as received. Heat sealable polyester bags were obtained through Ampac® Flexibles. All ingredients used to create the baked goods were purchased from a local grocery store.

TABLE 1: **QuEChERS Salts and dSPE Contents**

Product	**Contents**
Q-sep™ Q110	4g $MgSO_4$, 1g NaCl, 1g TSCD, 0.5g DHS
Q-sep™ Q211	150mg $MgSO_4$, 25mg PSA, 25mg C18
Q-sep™ Q252	150mg $MgSO_4$, 50mg PSA, 50mg C18, 50mg GCB

TSCD - trisodium citrate dehydrate

DHS - disodium hydrogen citrate sesquihydrate

PSA - primary and secondary amine exchange material

GCB - graphitized carbon black

Laboratory Equipment

(a) *Mixer* – A Vortex-Genie 2 apparatus from Scientific Industries (Bohemia, NY) was used for initial extraction and cleanup by dispersive SPE.

(b) *Centrifuges* – An International Clinical Centrifuge Model CL (Needham, MA) was used for 15 mL test tubes when needed. A Clay Adams Sero-Fuge II Centrifuge (Parsippany, NJ) was used for 5 mL test tubes when needed. An Eppendorf Centrifuge Model 5412 (Westbury, NY) was used for 1.5 mL test tubes when needed.

(c) *Analytical Balance* – A Mettler PM2000 (Hightstown, NJ) was used to weigh all samples.

(d) *Oven* – A Fisher Scientific Isotemp Oven (model 625G) was used to cook the baked goods.

Instrumentation

An Agilent Technologies 6890N Network Gas Chromatograph coupled to an Agilent 5973 Network Mass Selective Detector. Liquid injections were made using an Agilent 7683 Series Injector. Samples were separated on a Restek Rtx®-200MS capillary column (20 m × 180 μm × 0.20 μm). Helium was used as the carrier gas with the operating conditions listed in Table 2.

TABLE 2: GC-MS parameters (Rtx®-200MS Column)

GC		
	Inlet Temperature	260 °C
	Oven Program	Initial 100 °C for 1 min, ramp 75 °C/min to 175 °C, ramp 45 °C/min to 280 °C, hold for 10.67 min
	Column Flow	Constant flow @ 2.0 mL/min
	Column Pressure	Initial 42.00 psi for 2 min, ramp 5.00 psi/min to 60.00 psi, hold for 9.40 min
MS		
	Mass Range	40-500 m/z
	Sampling Rate	3.18 scans/s
	Threshold	200 counts

An Agilent 6890 Series Gas Chromatograph coupled to an Agilent 5973 Network Mass Selective Detector. Liquid injections were made using a Hewlett Packard 7683 Series Injector. Samples were separated on a Restek Rtx®-5MS capillary column (20 m ×180 μm × 0.18 μm). Hydrogen was used as the carrier gas with the operating conditions listed in Table 3.

TABLE 3: GC-MS parameters (Rtx®-5MS Column)

GC		
	Inlet Temperature	250 °C
	Oven Program	Initial 75 °C for 0.5 min, ramp 80 °C/min to 200 °C, ramp 55 °C/min to 300 °C, hold for 2.12 min
	Column Flow	Initial 1.2 mL/min for 0.9 min, ramp 0.30 mL/min to 1.8 mL/min
	Column Pressure	Constant pressure @ 12.8 psi
MS		
	Mass Range	40-500 m/z
	Sampling Rate	3.15 scans/s
	Threshold	200 counts

Evidentiary Sample Preparation

The ingredients for marijuana infused oil used for brownie samples were approximately 118 mL (1/2 cup) of vegetable oil and 5.00 g of finely ground dried marijuana. The following procedure for marijuana brownies was based on the directions from a website with illicit recipes containing controlled substances [2]. The oil and ground dried marijuana were combined in a large beaker and placed on a hot plate. This mixture was cooked at a low simmer for 30 minutes, stirring occasionally. The oil was poured through a gravity filtration system using a Whatman filter paper and additional forced air when needed. The oil was cooled to room temperature and then used in a commercial recipe for brownies. The brownies were baked at 350 °F (176 °C) for 15 minutes in a 9” × 13” sized pan enclosed within a vapor-tight, sealed Ampac® polyester bag. After baking, the brownies were allowed to cool and stored at room temperature.

The ingredients used for the infant formula adulterated with morphine were 34 g of Enfamil® Lipil milk-based infant formula powder (Mead Johnson & Company, Evansville, Indiana), approximately 236 mL (8 fl oz) of distilled water, and one 60 mg morphine tablet. The formula was prepared by crushing the morphine tablet to a fine powder using a mortar and pestle. This powder was combined with the formula powder and the mixture was prepared by adding the water to a canning jar. This mixture was stirred for 30 seconds and then the jar was capped for storage in a refrigerator. The contents were shaken for 30 seconds to ensure homogeneity prior to each sampling.

The procedures for the common laboratory extractions and sample preparations used are listed below. A method blank was performed for each extraction.

Marijuana Brownies

1.00 g of the prepared brownie sample was added to a test tube with 2 mL of methanol. The brownie material was dissolved into methanol by mashing for 2 minutes with 30 second vortex cycles every minute. The mixture was filtered through glass wool onto a medium size watch glass. The methanol was allowed to completely evaporate. Upon evaporation 2 mL of hexane was added to the watch glass, and swished around to coat the entire watch glass. The hexane was removed to a new test tube and vortexed for 30 sec. After mixing with a vortex, the test tube was centrifuged for 3 minutes on the high setting. Approximately 1 mL of hexane was taken for sample analysis.

Morphine Adulterated Infant Formula

10 mL of the adulterated infant formula was placed on a large watch glass and was evaporated to dryness at ambient temperature (2 days). 0.10 g of this dried formula was added to a test tube with 5 mL of 1% trimethylamine in methanol. This solution was vortexed for 30 seconds and centrifuged for 3 minutes on a high setting. The top portion of the methanol was removed to a new test tube. This methanol was allowed to evaporate down to approximately 200 μL for sample analysis.

Psilocybin Mushrooms

0.50 g of dried psilocybin mushroom material was ground finely with a mortar and pestle and brought up to 5 mL of saturated sodium bicarbonate. This mixture was mixed for 2 minutes with 30 second vortex cycles every minute. 5 mL of ethyl acetate was added to the test tube and vortexed for 30 seconds and then centrifuged for 5 minutes on a high setting. If an emulsion was created the top layer was extracted along with the emulsion and centrifuged for 3 seconds at 15,000 U/min. Approximately 1 mL of ethyl acetate was taken for sample analysis.

Psilocybin Mushrooms in Chocolate

2.00 g of chocolate adulterated with psilocybin mushrooms (concentration unknown) were added to a test tube with 4 mL of 10% acetic acid. An extraction following Sarwar and McDonald's method [10] was performed. Approximately 1 mL of methylene chloride was taken for sample analysis.

QuEChERS General Extraction Procedures

Restek's multiresidue QuEChERS procedure [3] is summarized as follows: 5 mL of a homogenized aqueous sample is mixed with half of a Q-sep™ Q110 salt packet (3.25 g). This preparation was shaken vigorously for one minute and vortexed for 30 seconds. After the initial vortex, 5 mL of acetonitrile was added and this mixture was shaken vigorously for one minute and vortexed for 30 seconds. After the second vortex, the sample was centrifuged for 5 minutes on a high setting. 1 mL of acetonitrile was removed for analysis.

The procedure for Restek's dSPE sample cleanup is summarized as follows: 2 mL of the extracted acetonitrile from the Q-sep™ Q110 extraction was removed and placed in either a Q-sep™ Q211 or Q-sep™ Q252 sample vial. This sample was shaken vigorously for one minute and vortexed for 30 seconds. After this vortex the sample was centrifuged for 10 seconds at 15,000 U/min.

Marijuana Brownies

1.00 g of the prepared brownie sample was brought up to 5 mL of an aqueous solution with deionized water. This sample was then treated with the general QuEChERS method described above. Further sample cleanup was done with Restek's dSPE procedure using two Q-sep™ Q211 vials. The acetonitrile extracts were filtered through glass wool into a new test tube and evaporated down to approximately 200 µL.

Morphine Adulterated Infant Formula

5 ml of adulterated formula was treated using Restek's general QuEChERS procedure. Further sample cleanup was done with Restek's dSPE procedure using two Q-sep™ Q211 vials. The acetonitrile extracts were filtered through glass wool into new test tubes and evaporated down to approximately 200 µL.

Psilocybin Mushrooms

0.50 g of dried mushroom material was ground finely with a mortar and pestle and brought up to 5 mL of an aqueous solution with deionized water. This sample was then treated with the general QuEChERS method described above. Further sample cleanup was done with Restek's dSPE procedure using two Q-sep™ Q252 vials. The acetonitrile extracts were filtered through glass wool into a new test tube and evaporated down to approximately 200 µL.

Psilocybin Mushrooms in Chocolate

2.00 g of chocolate adulterated with psilocybin mushrooms (concentration unknown) was brought up to 5 mL of an aqueous solution with deionized water and was mashed into a homogenous solution. This solution was then treated with the general QuEChERS method described above. Further sample cleanup was done with Restek's dSPE procedure using two Q211 salt packets. The acetonitrile extracts were filtered through glass wool into a new test tube and evaporated down to approximately 200 µl.

Methods

Ten samples were tested for each category listed above, five with the common extraction methods and five with the QuEChERS method. Tables 2 and 3 include the parameters for the two instruments used.

Data analysis was performed using Agilent MSD ChemStation software. The recovery and chromatography of target analytes, extraction time and co-extractives detected for both the common extractions and the QuEChERS extractions were evaluated and are listed in Table 4. These parameters were ranked on a 1 – 5 qualitative scale, with a score of 1 representing an undesirable result and a score of 5 representing a better quality of analysis.

TABLE 4: Summary of Extraction Method Results

		Marijuana Brownies†	Morphine Formula‡	Mushroom†	Chocolate Mushroom†
Common	Extraction Time	30 min	3 days	30 min	3 hours
	Recovery/ Chromatography	3	3	4	3
	Co-Extractives	2	1	4	4
QuEChERS	Extraction Time	30 min	25 min	30 min	30 min
	Recovery/ Chromatography	5	4	4	1
	Co-Extractives	4	4	5	1

Results and Discussion

Marijuana Brownies

QuEChERS extractions resulted in a positive identification of THC and cannabinol by way of retention time matching and mass spectra confirmation. The THC and cannabinol signal strengths were slightly weaker than the common extracts. The signal strengths for co-extractives decreased with the use of QuEChERS (Figure 1). The laboratory preparation using QuEChERS was comparable to common extraction techniques, showing more consistent results while requiring fewer consumable materials. The commonly employed extractions produced more carryover in successive blanks, leading to extensive instrument maintenance.

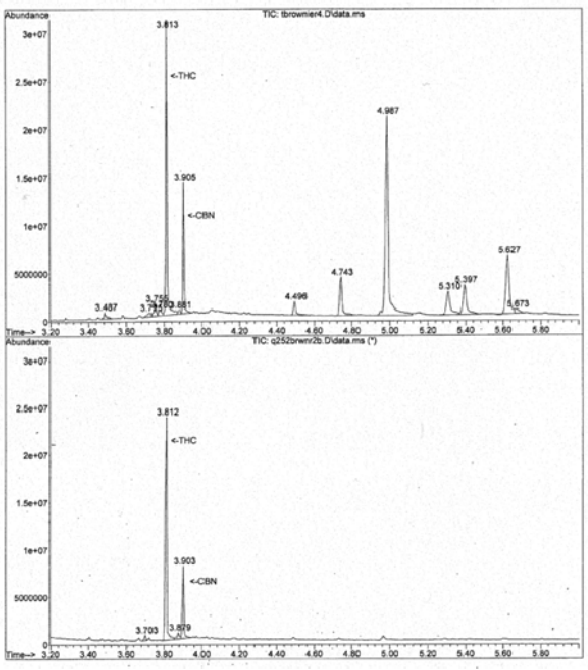


Figure 1: Representative TICs of common extraction methods for marijuana brownies (above) and the QuEChERS method (below).

Morphine Adulterated Infant Formula

QuEChERS extractions resulted in a positive identification of morphine during analysis by way of retention time matching and mass spectra confirmation. Signal strengths for co-extractives decreased dramatically, especially when using a more polar column (Figure 2). The QuEChERS extraction offered a much faster extraction time, and more consistent results. The common extractions were very lengthy and produced more carryover in successive blanks. The common extractions caused significant carryover and required instrument maintenance.

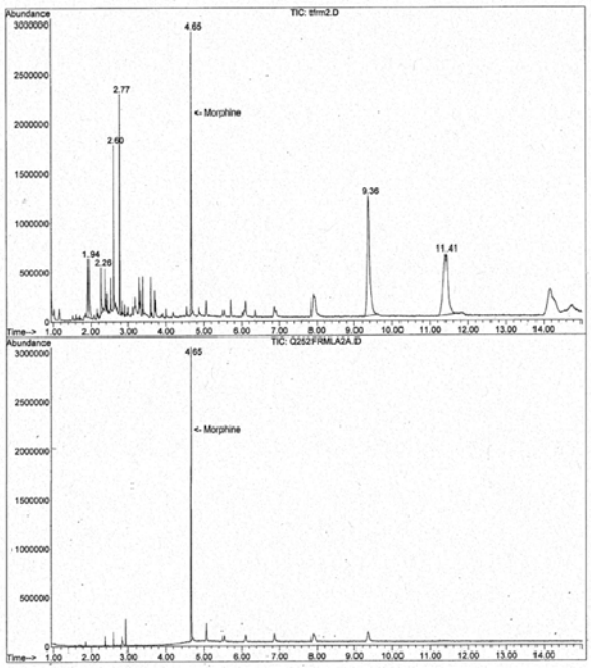


Figure 2: Representative TICs of common extraction methods for morphine in formula (above) and the QuEChERS method (below).

Psilocybin Mushrooms

QuEChERS extractions resulted in a positive identification of psilocin during analysis by way of retention time matching and mass spectra confirmation. The signal strength of psilocin when using QuEChERS was similar to the signal when a common extraction was employed (Figure 3). There was no emulsion created using the QuEChERS extraction, offering a faster preparation time requiring fewer consumable materials. No carryover was noted in successive blanks and there was no observed strain on the instruments for either extraction method.

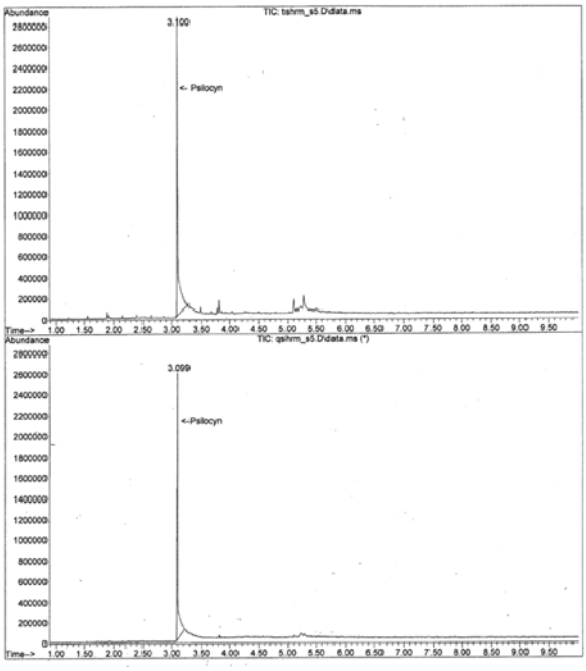


Figure 3: Representative TICs of common extraction methods for psilocybin mushrooms (above) and the QuEChERS method (below).

Psilocybin Mushrooms in Chocolate

QuEChERS extractions failed to show positive identification of psilocin by way of retention time confirmation and mass spectra matching to a standard when using both the multiresidue QuEChERS extraction and the dSPE sample cleanup (Q110, Q211 and Q252). The Sarwar and McDonald extractions were weak, however, a positive identification of psilocin was made.

Conclusion

The QuEChERS method of extraction is shown to be equally accurate and more efficient over common laboratory extractions for multiple samples, namely psilocybin mushrooms, marijuana brownies, and morphine adulterated infant formula. However, there were no significant improvements to extraction results for chocolate samples containing hallucinogenic mushrooms. The utilization of the cost effective (about $3 per sample) QuEChERS method of extraction has shown to be of potential benefit in forensic laboratories when analyzing samples of certain complex matrices. The use of the QuEChERS method prevents instrument downtime, and reduces overall materials while the results of those samples listed above improved, with the exception of chocolate mushrooms. Further study could be done on other commercial dSPE methods for the cleanup of chocolate mushroom samples. In the mean time, the QuEChERS technique presents itself as another tool for sample extraction of difficult matrices.

Acknowledgments

The authors thank Amanda Rigdon from Restek Corporation for her correspondence through the research project. All Q-sep™ QuEChERS supplies were provided by Restek Corporation.

References

[1] Anastassiades M, Lehotay SJ, Štajnbaher D, Schenck FJ. Fast and Easy Multiresidue Method Employing Acetonitrile Extraction/Partitioning and "Dispersive Solid-Phase Extraction" for the Determination of Pesticide Residues in Produce. J AOAC Int 2003; 86(2):412-431.

[2] A guide to making really great pot brownies. Applesoft [Internet]. [cited 2011 Jul 08]. Available from http://www.applesoft.com/brownies

[3} QuEChERS methodology: European and mini-multiresidue method. Restek Corporation [Internet]. [cited 2011 July 08]. Available from http://www.restek.com/pdfs/805-01-001.pdf

[4] Lehotay, SJ. Quick, Easy, Cheap, Effective, Rugged and Safe (QuEChERS) Approach for Determining Pesticide Residues. In: Martinez Vidal JL, Garrido Frenich, A, editors. Methods in Biotechnology, Vol. 19. Pesticide Protocols. Totowa, (NJ): Humana Press; 2005, p. 239-261.

[5] Schenck FJ, Hobbs JE, Evaluation of the Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) Approach to Pesticide Residue Analysis. Bull. Environ Contam Toxicol. 2004; 73(1): 24-30.

[6] Lehotay SJ, de Kok A, Hiemstra M, van Bodegraven P. Validation of a Fast and Easy Method for the Determination of 229 Pesticide Residues in Fruits and Vegetables Using Gas and Liquid Chromatography and Mass Spectrometric Detection. J AOAC Int. 2005; 88(2): 595-614.

[7] Majors RE. QuEChERS - A New Sample Preparation Technique for Multiresidue Analysis of Pesticides in Foods and Agricultural Samples. LCGC North America. 2007; 25(5).

[8] Nguyen TD, Lee BS, et al. A multiresidue method for the determination of 109 pesticides in rice using the Quick Easy Cheap Effective Rugged and Safe (QuEChERS) sample preparation method and gas chromatography/mass spectrometry. Rapid Commun Mass Spectrom. 2007; 21(18): 3115-22.

[9] Hercegova A, Domotorova M, et al. Comparison of sample preparation methods combined with fast gas chromatography-mass spectrometry for ultratrace analysis of pesticide residues in baby food. J Sep Sci. 2006; 29(8): 1102-9.

[10] Sarwar M, McDonald JL. A rapid extraction and GC/MS methodology for the identification of psilocyn in mushroom/chocolate concoctions. Microgram Journal 2003; 1(3-4):177-183.

In Memory
Brian G.D. Wraxall
(December 6, 1943 – May 11, 2012)

The past and present staff, families and friends of the Serological Research Institute (SERI) experienced a great sadness in May with the passing of our founder Brian Wraxall who lost his battle with prostate cancer. For the 35 years I knew him, he always exhibited the highest level of scientific integrity and professionalism.

Brian started out his career as a Forensic Biologist at the Metropolitan Police Laboratory (Scotland Yard) in London under the guidance of Bryan Culliford. I met him in 1977 and was lucky to be his assistant on the Bloodstain Analysis System (BAS) project. The laboratory techniques developed with Mark Stolorow became '*the*' genetic marker system in forensic labs until the advent of DNA. Brian contributed many techniques to Forensic Biology (Serology) including species cross-over, SAP/VAP, Haptoglobin, PGM subtype on agarose, P30 cross-over, P30 rocket, fetal hemoglobin, AK, EAP, PGM, GLO along with the four Multisystem Groups developed to advance U.S. Crime Lab serologist's techniques which were all firsts (see "A Forensic Journey" published in the CAC News, fourth quarter 2007).

Brian was the first one to offer formal training classes in Forensic Serology at the Met Lab in London. He continued on with training classes for the first 20 years in the U.S. and either trained or oversaw the training of hundreds of Forensic Serologists. Many people have told me that they just couldn't help liking Brian largely due to the charisma and charm exhibited by him at social gatherings.

When DNA became a forensic tool Brian "jumped on it with both feet" and over the years advanced the various DNA methods at SERI to keep our staff relevant in casework. Brian played a key role in many important court decisions across the country in the early days of DNA acceptance.

Brian's many interests outside of forensic biology were the theater (in Great Britain), photography of nature, aviaries, gardening, fishing, baseball, cultivating and cross-breeding orchids (past president of the San Francisco Orchid Society), traveling worldwide and he had just started beekeeping after his semi-retirement in January of this year.

Many will undoubtedly remember his infectious laughter, his leadership, high level of energy and enthusiasm for life as well as his love of laboratory bench work. He was truly a person who was larger than life in many ways.

To honor Brian's passing, SERI will soon have a page on our website dedicated to Brian's life and accomplishments. A scholarship fund will be established in Brian's name for training in Forensic Biology. Brian began a living legacy in 1978 which will be proudly continued by the dedicated staff of SERI.

Gary C. Harmor

RANDOM TOPICS FROM THE EDITOR

"I remember when!" and "Well, that's the way we've always done it!"

Our NWAFS President, Mr. Matt Noedel, recently sent me an email with a bunch of old advertisements. I don't know if he was trying to get back to his roots, if he just thought that they were funny or if he was really longing for the good old days! I didn't respond to his email as I could not fully appreciate these times but I did find them to be funny and scary at the same time though. You'll find a couple of them in this article and you may even start reminiscing...sorry for that!

In looking at these adds I am not only very thankful that change has occurred I am even more thankful that I survived my childhood! A common phrase of my mom's to me and my brothers and sisters was to "go play in traffic". Well, we happened to live on a fairly busy avenue and in today's world, saying that may have you answering questions to a law enforcement officer.

Could you imagine if the world continued to use "COLA" and "Blatz" in the raising of our children? Sure, you might say that that would never have continued as people always learn and are constantly improving. AND, we certainly would never make these mistakes again!

Well, I recently heard "well, we do that because we have always done it that way"! If you just think about this, this almost always raises an eyebrow for me and it seems to be an "interesting explanation" for something...what that something is or if it is successful I do not know. Or, who hasn't been in a conversation and then all of a sudden someone starts with the "I remember when..." phrase (think of a NWAFS hospitality room)?

Now, don't get me wrong, I too like to look at some of the things that I have done. Heck, I'm even more thankful that I still remember some of these things! I just think that we have to be more open and accept that change can be good.

In the last newsletter I discussed *success* and if one knows their direction, then they are more able to steer their way on a steady and stable course. Well, things are constantly changing and I believe that the ones that adapt to these changes have a better opportunity to be successful. That also means that you may be on your steady course only to realize that you need to quickly change and go another direction.

When I start to assemble thoughts and ideas for the newsletter, along with a topic for this column, it has made me think even more about the direction of our organization. And, "are we doing the things that we do because we have always done it that way"?

In my opinion, at times our organization has been stagnant with an unknown direction. But, let's look at what has been recently happening in our organization. We have established meetings for 2013, 2014 and have some good location ideas for 2015. Our focused research topics will continue in Missoula which will provide more technical submissions. Matt has even been recently contacted by a instrument vendor to help them with a research opportunity that may not only assist them but forensics as a whole. **The Board and the NWAFS organization is adapting to change and we are evaluating "the way that we have always done it"!**

Looking back upon your past experiences has its place but it may not be the best if you are just re-calling all of your past experiences to apply them to address all of your problems today. Yes, I think that change can be difficult but I believe that if you want to move forward one must invest a bit of energy, be willing to make a change and evaluate the **"the way that you have always done it"!** With this you (the NWAFS organization, your agency) can be contributing positively in a timely manner. Although we still need to work hard to move forward, I foresee a strong NWAFS future ahead. Personally, I want my phrase to be something like "Tomorrow I envision...!" Thanks for reading and make sure to enjoy a cold one today!

OCTOBER TERM, 2011

Syllabus

NOTE: Where it is feasible, a syllabus (headnote) will be released, as is being done in connection with this case, at the time the opinion is issued. The syllabus constitutes no part of the opinion of the Court but has been prepared by the Reporter of Decisions for the convenience of the reader. See *United States* v. *Detroit Timber & Lumber Co.,* 200 U. S. 321, 337.

SUPREME COURT OF THE UNITED STATES

Syllabus

WILLIAMS *v.* ILLINOIS

CERTIORARI TO THE SUPREME COURT OF ILLINOIS

No. 10–8505. Argued December 6, 2011—Decided June 18, 2012

At petitioner's bench trial for rape, Sandra Lambatos, a forensic specialist at the Illinois State Police lab, testified that she matched a DNA profile produced by an outside laboratory, Cellmark, to a profile the state lab produced using a sample of petitioner's blood. She testified that Cellmark was an accredited laboratory and that business records showed that vaginal swabs taken from the victim, L. J., were sent to Cellmark and returned. She offered no other statement for the purpose of identifying the sample used for Cellmark's profile or establishing how Cellmark handled or tested the sample. Nor did she vouch for the accuracy of Cellmark's profile. The defense moved to exclude, on Confrontation Clause grounds, Lambatos' testimony insofar as it implicated events at Cellmark, but the prosecution said that petitioner's confrontation rights were satisfied because he had the opportunity to cross-examine the expert who had testified as to the match. The prosecutor argued that Illinois Rule of Evidence 703 permitted an expert to disclose facts on which the expert's opinion is based even if the expert is not competent to testify to those underlying facts, and that any deficiency went to the weight of the evidence, not its admissibility. The trial court admitted the evidence and found petitioner guilty. Both the Illinois Court of Appeals and the State Supreme Court affirmed, concluding that Lambatos' testimony did not violate petitioner's confrontation rights because Cellmark's report was not offered into evidence to prove the truth of the matter asserted.

Held: The judgment is affirmed.

238 Ill. 2d 125, 939 N. E. 2d 268, affirmed.

JUSTICE ALITO, joined by THE CHIEF JUSTICE, JUSTICE KENNEDY, and JUSTICE BREYER, concluded that the form of expert testimony given in this case does not violate the Confrontation Clause. Pp. 10–33.

WILLIAMS *v.* ILLINOIS

Syllabus

(a) Before *Crawford* v. *Washington*, 541 U. S. 36, this Court took the view that the Confrontation Clause did not bar the admission of out-of-court statements that fell within a firmly rooted exception to the hearsay rule. In *Crawford,* the Court held that such statements could be "admitted only where the declarant is unavailable, and only where the defendant has had a prior opportunity to cross-examine." *Id*., at 59. In both *Melendez-Diaz* v. *Massachusetts*, 557 U. S. 305, and *Bullcoming* v. *New Mexico*, 564 U. S. ___, two of the many cases that have arisen from *Crawford,* this Court ruled that scientific reports could not be used as substantive evidence against a defendant unless the analyst who prepared and certified the report was subject to confrontation. In each case, the report at issue "contain[ed] a testimonial certification, made in order to prove a fact at a criminal trial." 564 U. S., at ___–___. Here, in contrast, the question is the constitutionality of allowing an expert witness to discuss others' testimonial statements if those statements are not themselves admitted as evidence. Pp. 10–13.

(b) An expert witness may voice an opinion based on facts concerning the events at issue even if the expert lacks first-hand knowledge of those facts. A long tradition in American courts permits an expert to testify in the form of a "hypothetical question," where the expert assumes the truth of factual predicates and then offers testimony based on those assumptions. See *Forsyth* v. *Doolittle*, 120 U. S. 73, 77. Modern evidence rules dispense with the need for hypothetical questions and permit an expert to base an opinion on facts "made known to the expert at or before the hearing," though such reliance does not constitute admissible evidence of the underlying information. Ill. Rule Evid. 703; Fed. Rule Evid. 703. Both Illinois and Federal Rules bar an expert from disclosing the inadmissible evidence in jury trials but not in bench trials. This is important because *Crawford,* while departing from prior Confrontation Clause precedent in other respects, reaffirmed the proposition that the Clause "does not bar the use of testimonial statements for purposes other than establishing the truth of the matter asserted." 541 U. S., at 59, n. 9. Pp. 13–16.

(c) For Confrontation Clause purposes, the references to Cellmark in the trial record either were not hearsay or were not offered for the truth of the matter asserted. Pp. 16–27.

(1) Petitioner's confrontation right was not violated when Lambatos answered "yes" to a question about whether there was a match between the DNA profile "found in semen from the vaginal swabs of [L. J.]" and the one identified as petitioner's. Under Illinois law, this putatively offending phrase was not admissible for the purpose of proving the truth of the matter asserted—*i.e.,* that the matching

DNA profile was "found in semen from the vaginal swabs." Rather, that fact was a mere premise of the prosecutor's question, and Lambatos simply assumed it to be true in giving her answer. Because this was a bench trial, the Court assumes that the trial judge understood that the testimony was not admissible to prove the truth of the matter asserted. It is also unlikely that the judge took the testimony as providing chain-of-custody evidence. The record does not support such an understanding; no trial judge is likely to be so confused; and the admissible evidence left little room for argument that Cellmark's sample came from any source but L. J.'s swabs, since the profile matched the very man she identified in a lineup and at trial as her attacker. Pp. 16–21.

(2) Nor did the substance of Cellmark's report need to be introduced in order to show that Cellmark's profile was based on the semen in L. J.'s swabs or that its procedures were reliable. The issue here is whether petitioner's confrontation right was violated, not whether the State offered sufficient foundational evidence to support the admission of Lambatos' opinion. If there were no proof that Cellmark's profile was accurate, Lambatos' testimony would be irrelevant, but the Confrontation Clause bars not the admission of irrelevant evidence, but the admission of testimonial statements by declarants who are not subject to cross-examination. Here, the trial record does not lack admissible evidence with respect to the source of the sample tested by Cellmark or the reliability of its profile. The State offered conventional chain-of-custody evidence, and the match between Cellmark's profile and petitioner's was telling confirmation that Cellmark's profile was deduced from the semen on L. J.'s swabs. The match also provided strong circumstantial evidence about the reliability of Cellmark's work. Pp. 21–25.

(3) This conclusion is consistent with *Bullcoming* and *Melendez-Diaz,* where forensic reports were introduced for the purpose of proving the truth of what they asserted. In contrast, Cellmark's report was considered for the limited purpose of seeing whether it matched something else, and the relevance of that match was established by independent circumstantial evidence showing that the report was based on a sample from the crime scene. There are at least four safeguards to prevent abuses in such situations. First, trial courts can screen out experts who would act as conduits for hearsay by strictly enforcing the requirement that experts display genuine "scientific, technical, or other specialized knowledge" to help the trier of fact understand the evidence or determine a fact at issue. Fed. Rule Evid. 702(a). Second, experts are generally precluded from disclosing inadmissible evidence to a jury. Third, if such evidence is disclosed, a trial judge may instruct the jury that the statements cannot be ac-

cepted for their truth, and that an expert's opinion is only as good as the independent evidence establishing its underlying premises. Fourth, if the prosecution cannot muster independent admissible evidence to prove foundational facts, the expert's testimony cannot be given weight by the trier of fact. Pp. 25–27.

(e) Even if Cellmark's report had been introduced for its truth, there would have been no Confrontation Clause violation. The Clause refers to testimony by "witnesses against" an accused, prohibiting modern-day practices that are tantamount to the abuses that gave rise to the confrontation right, namely, (a) out-of-court statements having the primary purpose of accusing a targeted individual of engaging in criminal conduct, and (b) formalized statements such as affidavits, depositions, prior testimony, or confessions. These characteristics were present in every post-*Crawford* case in which a Confrontation Clause violation has been found, except for *Hammon* v. *Indiana*, 547 U. S. 813. But, even in *Hammon,* the particular state- ment, elicited during police interrogation, had the primary purpose of accusing a targeted individual. A person who makes a statement to resolve an ongoing emergency is not like a trial witness because the declarant's purpose is to bring an end to an ongoing threat. *Michigan* v. *Bryant,* 562 U. S. ___, ___. Such a statement's admissibility "is the concern of . . . rules of evidence, not the Confrontation Clause. " *Id.,* ___–___ . The forensic reports in *Melendez-Diaz* and *Bullcoming* ran afoul of the Confrontation Clause because they were the equivalent of affidavits made for the purpose of proving a particular criminal defendant's guilt. But the Cellmark report's primary purpose was to catch a dangerous rapist who was still at large, not to obtain evidence for use against petitioner, who was neither in custody nor under suspicion at that time. Nor could anyone at Cellmark possibly know that the profile would inculpate petitioner. There was thus no "prospect of fabrication" and no incentive to produce anything other than a scientifically sound and reliable profile. *Bryant, supra,* at ___, ___. Lab technicians producing a DNA profile generally have no way of knowing whether it will turn out to be incriminating, exonerating, or both. And with numerous technicians working on a profile, it is like- ly that each technician's sole purpose is to perform a task in accord- ance with accepted procedures. The knowledge that defects in a DNA profile may be detected from the profile itself provides a further safe- guard. Pp. 28–33.

JUSTICE THOMAS concluded that the disclosure of Cellmark's out-of-court statements through Lambatos' expert testimony did not violate the Confrontation Clause solely because Cellmark's statements lacked the requisite "formality and solemnity" to be considered " 'testimonial,' " see *Michigan* v. *Bryant,* 562 U. S. ___, ___ (THOMAS, J.,

concurring in judgment). Pp. 1–16.

(a) There was no plausible reason for the introduction of Cellmark's statements other than to establish their truth. Pp. 1–8.

(1) Illinois Rule of Evidence 703 permits an expert to base his opinion on facts about which he lacks personal knowledge and to disclose those facts to the trier of fact. Under Illinois law, such facts are not admitted for their truth, but only to explain the basis of the expert's opinion. See *People* v. *Pasch,* 152 Ill. 2d 133. But state evidence rules do not trump a defendant's constitutional right to confrontation. This Court ensures that an out-of-court statement was introduced for a "legitimate, nonhearsay purpose" before relying on the not-for-its-truth rationale to dismiss the Confrontation Clause's application. See *Tennessee* v. *Street*, 471 U. S. 409, 417. Statements introduced to explain the basis of an expert's opinion are not introduced for a plausible nonhearsay purpose because, to use the basis testimony in evaluating the expert's opinion, the factfinder must consider the truth of the basis testimony. This commonsense conclusion is not undermined by any historical practice exempting expert basis testimony from the rigors of the Confrontation Clause. Before the Federal Rules of Evidence were adopted in 1975, an expert could render an opinion based only on facts that the expert had personally perceived or learned at trial. In 1975, that universe of facts was expanded to include facts that the expert learned out of court by means other than his own perception. The disclosure of such facts raises Confrontation Clause concerns. Pp. 2–5.

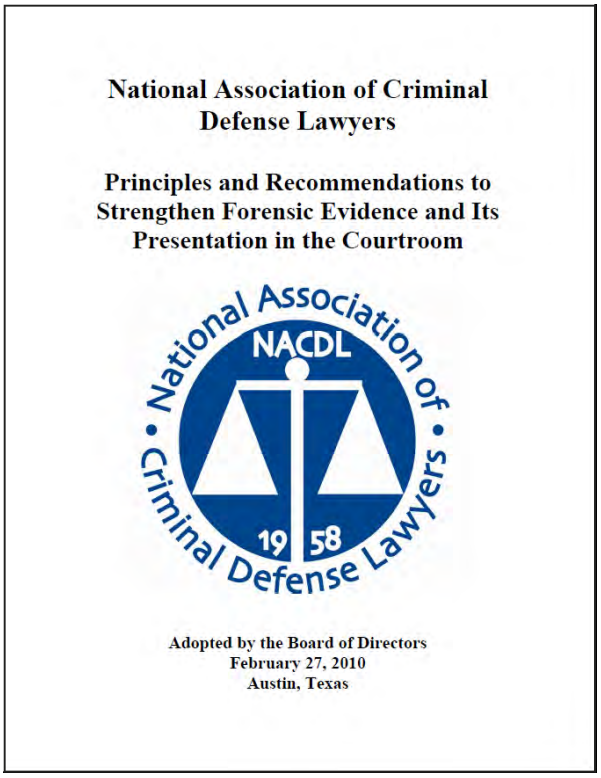
(2) Those concerns are fully applicable here. In concluding that petitioner's DNA profile matched the profile derived from L. J.'s swabs, Lambatos relied on Cellmark's out-of-court statements that its profile was in fact derived from those swabs, rather than from some other source. Thus, the validity of Lambatos' opinion ultimately turned on the truth of Cellmark's statements. Pp. 5–7.

(b) These statements, however, were not "testimonial" for purposes of the Confrontation Clause, which "applies to 'witnesses' against the accused—in other words, those who 'bear testimony.' " *Crawford* v. *Washington*, 541 U. S. 36, 51. " 'Testimony,' " in turn, is " '[a] solemn declaration or affirmation made for the purpose of establishing or proving some fact.' " *Ibid.* In light of its text, the Confrontation Clause regulates only the use of statements bearing "indicia of solemnity." *Davis* v. *Washington,* 547 U. S. 813, 836–837, 840 (opinion of THOMAS, J.). This test comports with history because solemnity marked the practices that the Confrontation Clause was designed to eliminate, namely, the *ex parte* examination of witnesses under Eng- lish bail and committal statutes. See *id.,* at 835. Accordingly, the Clause reaches "formalized testimonial materials," such as deposi-

tions, affidavits, and prior testimony, or statements resulting from "formalized dialogue," such as custodial interrogation. *Bryant, supra,* at ___. Applying these principles, Cellmark's report is not a state- ment by a "witnes[s]" under the Confrontation Clause. It lacks the solemnity of an affidavit or deposition, for it is neither a sworn nor a certified declaration of fact. And, although it was pro- duced at the re- quest of law enforcement, it was not the product of formalized dialogue resembling custodial interrogation. *Melendez-Diaz,* 557 U. S. 305, and *Bullcoming* v. *New Mexico,* 564 U. S. ___, distinguished. Pp. 8–15.

ALITO, J., announced the judgment of the Court and delivered an opinion, in which ROBERTS, C. J., and KENNEDY and BREYER, JJ., joined. BREYER, J., filed a concurring opinion. THOMAS, J., filed an opinion concurring in the judgment. KAGAN, J., filed a dissenting opinion, in which SCALIA, GINSBURG, and SOTOMAYOR, JJ., joined.

We should all be familiar with the NAS report. But, did you know that there is a report issued by the National Association of Criminal Defense Lawyers? Some good reading so check it out!



Technical Article

Measurement and Variation of UV Absorbers within Multi-Year Samples of Automotive Clear Coat Paint

Steven Stone[1], Margaret Barber[1], Ronald Wojciechowski[2], Paul Martin, Ph.D.[3]

[1]Washington State Patrol Crime Laboratory, Seattle, WA
[2]Washington State Patrol Crime Laboratory, Tacoma, WA
[3]CRAIC Technologies Inc., San Dimas, CA

Introduction:

Clear coats have become ubiquitous in automotive paint since their introduction in the early 1970's. In addition to the role of the clear coat in providing protection to the vehicle from nicks and scratches, ultraviolet (UV) light absorbers are also added to protect the color coat from degradation.[1,3] The typical classes of UV absorbers added to clear coats are 2-hydroxypheny-S-triazines or 2 -hydroxyphenylbenzotriazoles. These compounds are designed to capture UV light and, through photochemical processes, prevent the light from reaching the color coat (*Figure 1)*.[2,3]

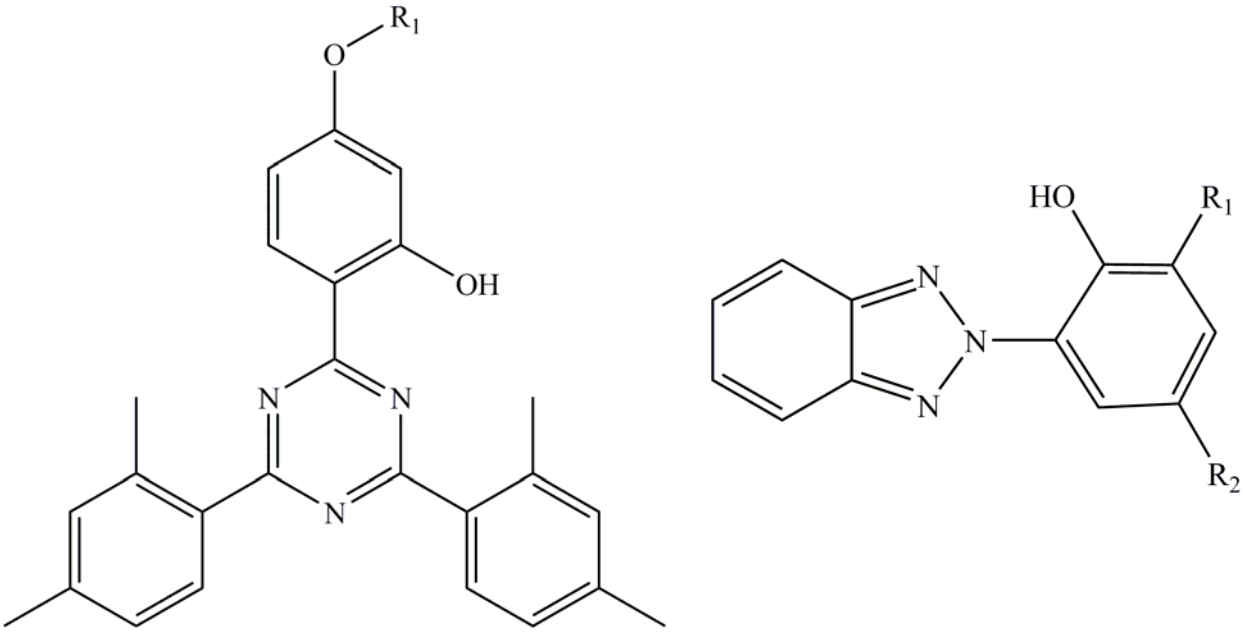


Figure 1 – Example structures of hydroxyphenyl-S-triazines (left) and hydroxyphenylbenzotriazoles (right)[3]

These compounds are generally used along with hindered amine light stabilizers (HALS) to protect the color coats (*Figure 2)*.[3]

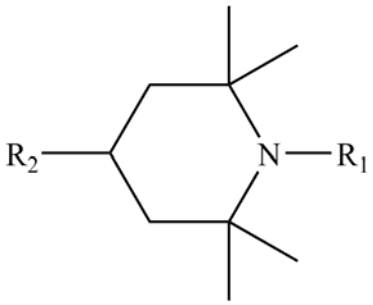


Figure 2 – Example structure of a hindered amine light stabilizer (HALS).[3]

Over time, the degradation of UV absorbers in a clear coat occurs due to exposure to the environment.[4] This degradation should be more pronounced within a clear coat layer nearer to the environment. Because of this the concentration of UV absorbers should be seen to vary; a higher concentration near the color coat, and a lower concentration near the environment. In order to observe this trend, a UV-visible microspectrophotometer (MSP) can be employed to perform selective analysis of the UV absorbers in the clear coat at different depths within the layer.

Forensic examination of clear coats is traditionally done using a combination of Fourier transform infrared spectroscopy (IR) and pyrolysis gas chromatography / mass spectrometry (Py-GC/MS).[4,6] Discrimination and association between clear coats can be achieved using these methods, but we hope to show that MSP can also be added to these traditional methods to aid in clear coat analysis. It can provide data throughout the depth of a layer and contribute useful information to the analysis.

This paper is the culmination of a one day research project at the NWAFS Fall 2011 Meeting with some additional work that was completed at a later date. The goal is to show how the MSP can be employed during analysis of clear coats using a methodology that includes a combination of stereomicroscopy, IR, and MSP. This methodology can provide a large amount of data quickly.

Methods:

Samples from several Washington State Patrol (WSP) Ford Crown Victorias were collected for use in this study. Samples from model years of 2000, 2002-2005, 2007, and 2008 were selected for analysis. All of the selected samples were from vehicles manufactured in the same facility and all of the selected samples were of the same paint color. The Vehicle Identification Number (VIN) for each of the selected vehicles was checked using VINassist® to verify the year and plant of manufacture (*Figure 3*).

Year	VIN	Area Sampled	Plant
2000	2FAFP71W5YX140503	Trunk	St. Thomas, Talbotville, Canada
2002	2FAFP71WX2X118648	Hood	St. Thomas, Talbotville, Canada
2003	2FAFP71W93X132526	Hood	St. Thomas, Talbotville, Canada
2004	2FAHP71W34X121001	Left Rear Roof	St. Thomas, Talbotville, Canada
2005	2FAHP71W45X143008	Roof	Talbotville, Canada
2007	2FAHP71W37X132746	Left Rear Roof	St. Thomas, Talbotville, Canada
2008	2FAHP71V08X178155	Left Rear Roof Post	St. Thomas, Talbotville, Canada

Figure 3 - Samples used in this study. The year and manufacturing plant information was confirmed using VINAssist®. Talbotville, Canada is the same plant as St. Thomas, Talbotville, Canada, The names are taken directly from VINassist®.

The samples were first mounted in epoxy (Double/Bubble) and then cross-sectioned using a microtome (American Optical) at 7-microns thick. Previous research has suggested cross section thicknesses of 20 microns,[2] but current instrumentation for UV microspectroscopy is able to analyze thinner cross-sections. Thinner cross-sections are able to be used on multiple instruments even if the instruments are older. The prepared cross-sections were checked to make sure they were a consistent thickness, and layer structure (i.e. clear coat, color coat, under coat) using a stereomicroscope. They were then placed on a potassium bromide window and analyzed with an IR microspectrometer (Perkin-Elmer) in transmittance mode. These same cross sections were then mounted in glycerin on a quartz microscope slide and analyzed on an MSP (CRAIC Technologies) in transmission mode.

In order to ensure consistency with regard to the UV absorbers across the various model years, an MSP spectrum was taken from each of the selected samples at an area close to the color coat. This would be the depth at which the clear coat would be expected to have the least possible degradation. In order to observe the changes in UV absorber concentration through a layer, spectra were taken from closest to the color coat and moving outwards towards the environment (*Figure 4*).

Figure 4 – Example of a paint chip cross-section with how the clear coat was sampled for MSP analysis within a layer. Spot 1 is closest to the color coat and Spot 4 is closest to the environment.

MSP data showing the consistency in UV absorbers for all samples and the decrease in UV absorbance throughout the depth of a layer for one sample, as well as IR data for all samples was collected at the NWAFS Fall 2011 Meeting in Tacoma, WA. Only one IR spectrum was taken for each manufacturing year. Further data showing the decrease in UV absorbance in a layer for all samples was completed post-meeting in Seattle with the same model MSP and similar experimental conditions, but with freshly prepared cross-sections made on a different microtome (American Optical).

Results and Discussion:

Analysis using the methodology described above is quick, efficient, and allows the same sample to be used with different techniques. The data from the Fall Meeting displays consistency in the IR spectra (*Figures 5 and 6*). Although there are slight differences present in the IR spectra of the different samples, they are not substantive enough to eliminate one sample from another during comparison. It may have been possible to account for the variances in the transmission line and possible contributions of components from the color coat with additional data collection, but this was not possible within the time constraints.

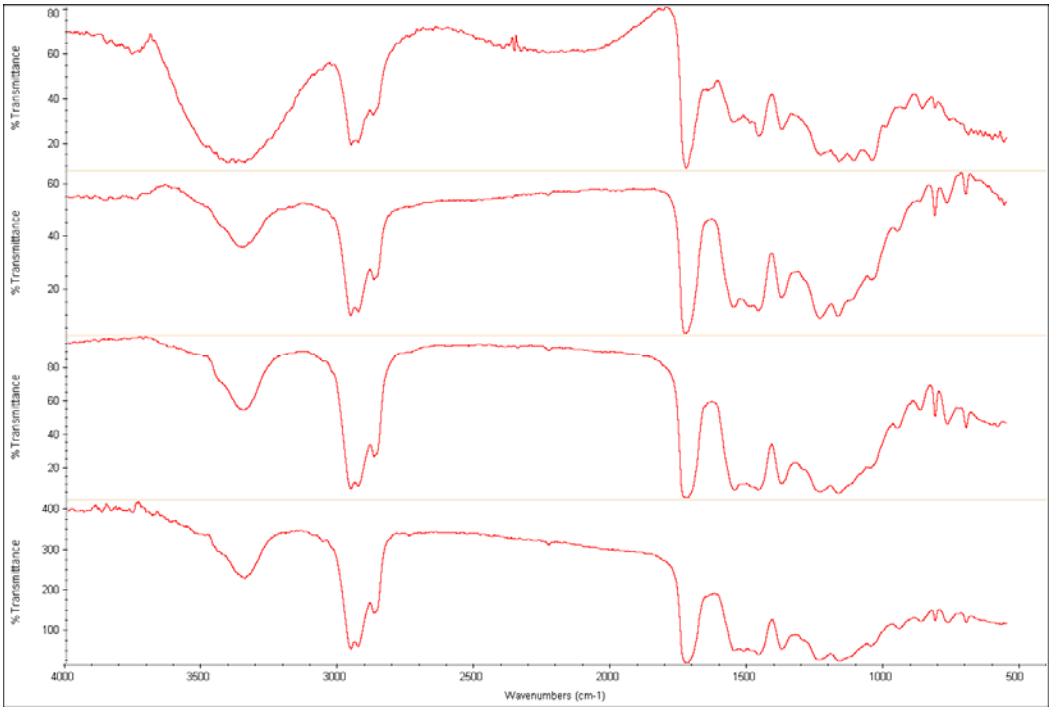


Figure 5 - IR Data collected at the NWAFS Fall 2011 Meeting. This set includes (from top to bottom) 2000, 2002, 2003, and 2004.

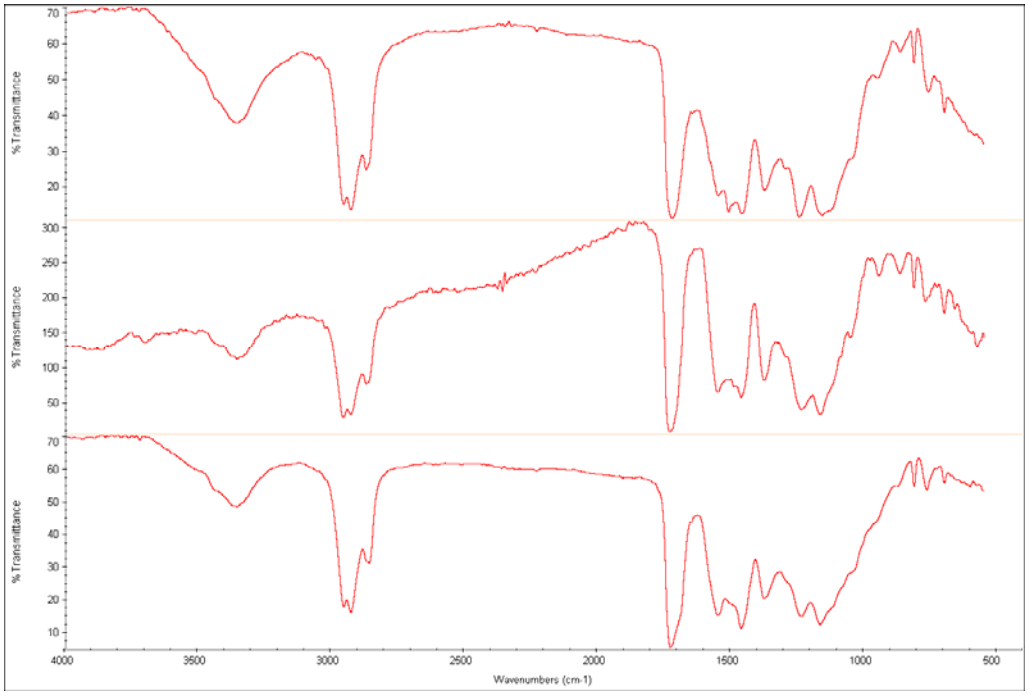


Figure 6 - IR Data collected at the NWAFS Fall 2011 Meeting. This set includes (from top to bottom) 2005, 2007, and 2008.

The MSP data displays a similar trend. The different years display a consistency in peak shape and peak location. Variation in absorbance is due to the similar components having different relative concentrations (*Figure 7*).

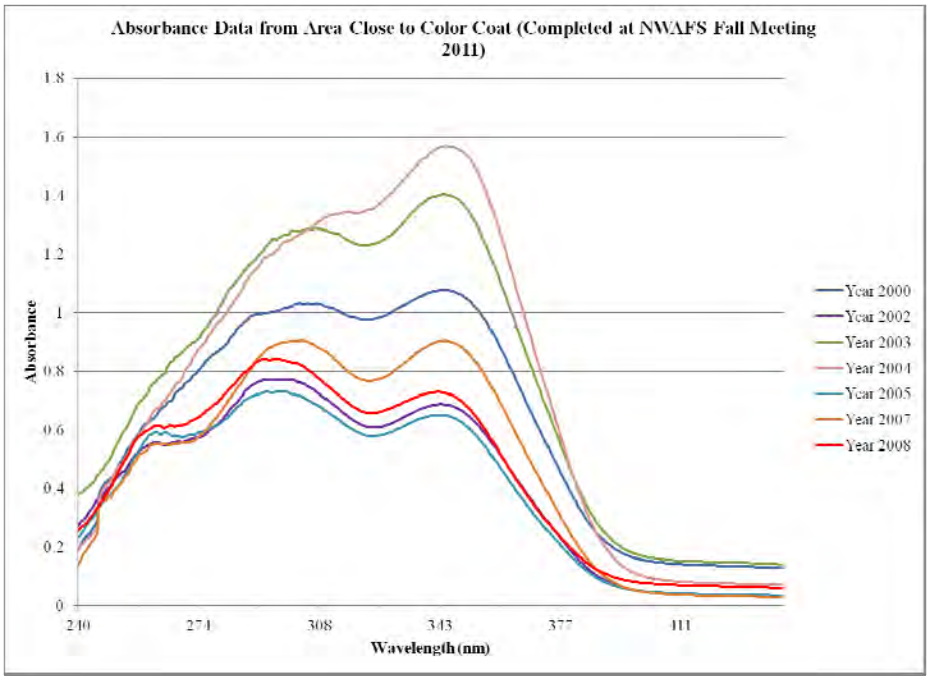


Figure 7 – MSP Data taken at Spot 1 at the NWAFS Fall 2011 Meeting taken close to the color coat.

There is a decrease in the amount of UV absorption throughout a clear coat layer. This was first measured during the Fall Meeting in the sample from 2002 (*Figure 8*). Subsequent to the Fall meeting the samples were retested by sampling four points in the clear coat as previously described. A decrease in UV absorption through a clear coat layer was produced for each year. Examples of the degradation include the 2002 data (same sample as the NWAFS data), and the 2000 data (*Figures 9* and *10*).

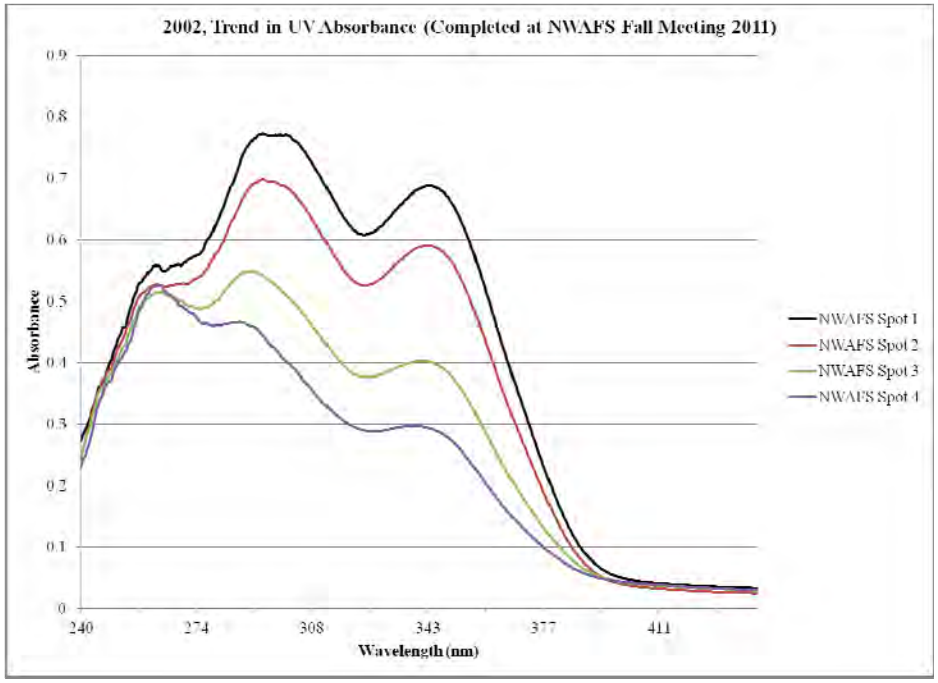


Figure 8 - Data for the 2002 sample taken at the NWAFS Fall 2011 Meeting. Data was from closest to the color coat (Spot 1) to closest to the environment (Spot 4). The degradation of the UV absorbers in the clear coat is shown by the decrease in the absorbance values.

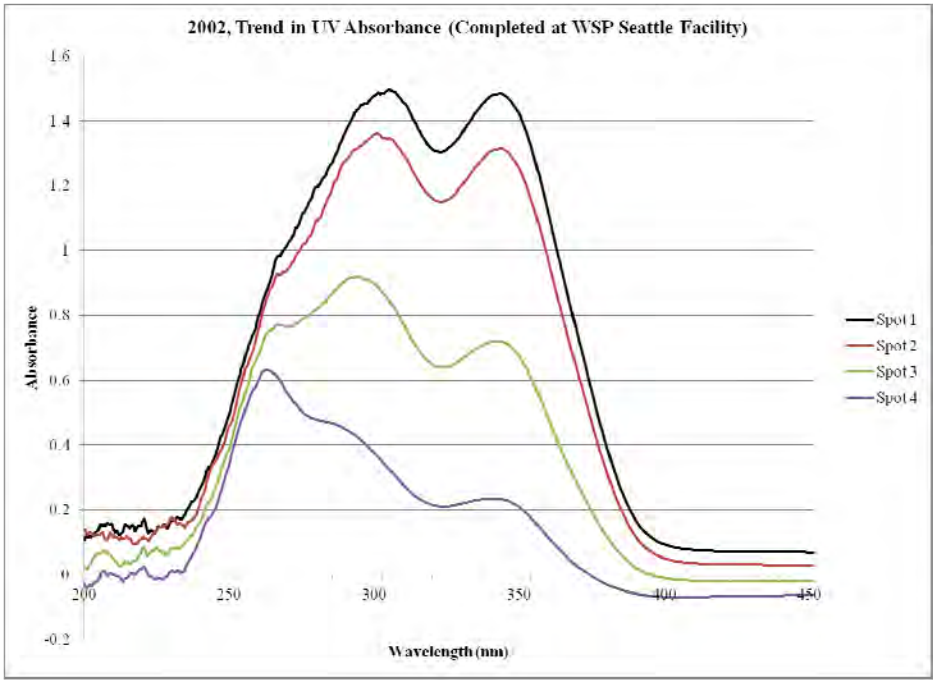


Figure 9 - Data for the 2002 sample taken at the WSP Seattle Crime Lab. Data was from closest to the color coat (Spot 1) to closest to the environment (Spot 4).

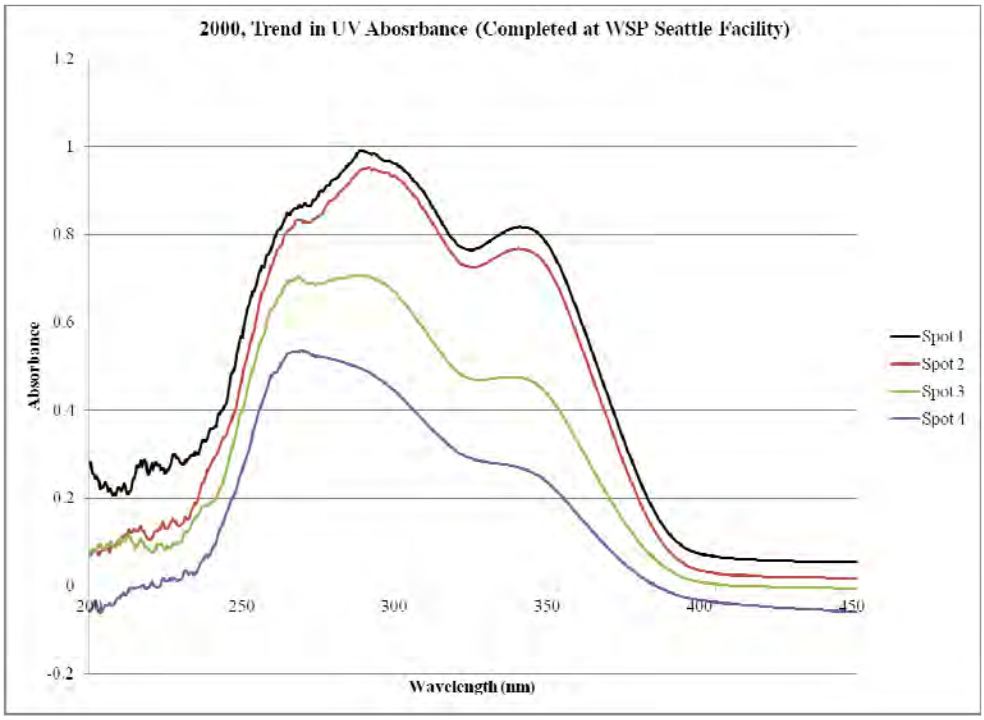


Figure 10 - Data for the 2000 sample taken at the WSP Seattle Crime Lab. Data was from closest to the color coat (Spot 1) to closest to the environment (Spot 4).

The data shows a decrease in UV absorption in a clear coat as the sampling area is moved closer to the environment rather than the color coat. This trend is due to the interaction of sunlight with the UV absorbers previously discussed.[4] Theoretically, a starker decrease in UV absorbers should be seen in 2000 than in later years. This will not always be the case due to other factors such as the environment that the car is used in, and the amount the vehicle is used.

It is important to note that the sampling through the layer at differing depths can make a large difference in what data is collected. Even samples taken close to each other can exhibit differences in relative concentration as was seen with the 2002 sample. If a sample is taken close to the nominally exposed surface for a questioned sample and close to the color coat for a known sample, it may lead to a perceived difference between two samples that actually share a common origin.

Conclusions:

The methodology developed for sampling and analyzing clear coats is quick and efficient. In one day, a series of paint chips were cross-sectioned using a microtome then analyzed using a series of stereoscopic, IR, and MSP exams. This series could be adapted to include additional instrumentation after MSP including SEM and, finally, Py-GC/MS. An examiner would be able to obtain a wide variety of data with only trace amount of material. The sample size needed for analysis is dependent on the equipment in the laboratory and consistency in the sample preparation and sampling location is critical. Any inconsistency in the sampling and analysis can possibly lead to variations in results and a possible false elimination.

The data collected clearly shows a degradation of UV absorber that occurs through a clear coat layer. Questions that will be investigated in the future are whether this trend is consistent for different areas on the same panel of one vehicle and whether there is variation in clear coat absorption between different parts on the same vehicle.

Acknowledgements:

We would like to thank the NWAFS for the chance to conduct this research. Also, we would like to thank Tracy Warren and Gary Armstrong of the WSP fleet section for access to the vehicles used in this study.

References:

1. Caddy, B (Ed.) 2001. Forensic Examination of Glass and Paint. 1st Edition. London (U.K.).

2. Stocklein, W.; Fujiwara, H. 1999. The Examination of UV-Absorbers in 2-Coat Metallic and Non-metallic Automotive Paints. Science & Justice. 39(3):188-95.

3. Hans-Joachim Streitberger; Karl-Friedrich Dössel (Eds.) 2008. Automotive Paints and Coatings. 2nd Edition. Weinheim (Germany).

4. Burns, D.; Doolan, K. 2005. The Discrimination of Automotive Clear Coat Paints Indistinguishable
by Fourier Transform Infrared Spectroscopy via Pyrolysis–Gas Chromatography-Mass Spectrometry. Analytica Chimica Acta. 539:157–64.

5. Oberg, P. 2000, Effectiveness of UV Absorbers in Selected Automotive Topcoats. Polymeric Materials Science and Engineering, 83(129): 129-31.

6.Plage, B. et al. 2008. The Discrimination of Automotive Clear Coats by Pyrolysis-Gas Chromatography/Mass Spectrometry and Comparison of Samples by a Chromatogram Library Software. Forensic Science International. 177:146–52.

NWAFS Board Positions Now Seeking!

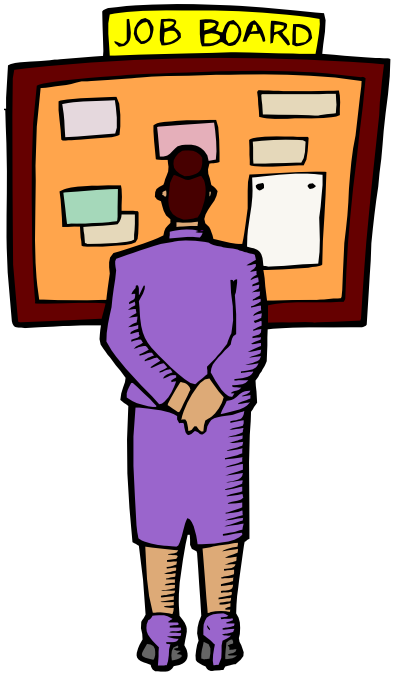
With the year 1/2 way over the NWAFS board would like to offer any regular member the opportunity to serve our organization. This is an excellent way to not only be part of our organization, but help steer it into the future. As Matt said in this President's Message, "our organization survives solely on the backs of the membership". The momentum of the NWAFS is going in a positive direction and it is only going to get better. It is time for us all to step up to the plate and continue the NWAFS for another 40 years!

The two board positions which will be open, and will be voted on during the Missoula Meeting, are:

Member-at-Large
Editor

Please inquire with any one of our current and past board members if you have any questions. Or, just let one the board members know of your interest and which position. Information on the duties and requirements of these positions can be found at:

http://nwafs.org/CONSTITUTION.htm



Technical Article

Using Adobe® Photoshop® as an Evidence Screening Tool for Contact Transfer Examinations

Jeff Jagmin, Washington State Patrol Crime Laboratory

Abstract
This technical note will provide two case examples of how Adobe® Photoshop® can quickly and easily be used as an additional technique for screening evidence in contact transfer cases.

Introduction
Contact transfer exams are typically encountered in hit and runs, assaults, air bag deployment or anywhere forcible contact is made. A visual examination of physical evidence is the start of any forensic case. After this initial examination, it is up to the scientist to decide how to proceed. One often chooses their route based upon their experience and what techniques they are familiar with. Other sight-based techniques which may, or may not, be utilized in these examinations are an alternate light source (UV, IR and visible) and camera filters to better observe a possible contact. With the use of Adobe® Photoshop®, many of these other techniques can be accomplished by changing the Color Modes (CMYK or Lab color). Two case examples will be used to show how Photoshop® can be used in screening evidence.

Materials and Methods
A digital-SLR camera with adequate resolution (over 8 MB per image) was used to capture images of areas of where potential contact transfer(s) occurred. Adobe® Photoshop® CS5 was then used to enhance these images.

Case Example 1
This case involved a hit and run where the individual was severely injured. The injuries were mostly on one side with the majority of these to the leg and hip area. The question was if it could be determined if there was anything on the clothing to help provide an investigative lead of who may have or what had hit this person. The evidence submitted was the victim's clothing (sweat pants and jacket).

The initial examination of this case occurred over 5 years ago. The submitted evidence had been cut by emergency personnel to render aid. The only obvious area of interest was on the lower leg of the sweatpants with an area with 3 parallel lines/marks near the area where they were cut. Visual and stereoscopic examinations did not render any additional information. An alternate light source (ALS) was used to further examine the area and an impression was identified near the parallel lines.

Although an impression was present, it could not be easily documented. However, with different filters/goggles the impression was more apparent. At first the impression(s) were traced with the use of plastic transparencies. Photography was then attempted to capture this impression information. A digital camera was used to document the pants without the aid of any filters and the fabric was affixed to a piece of cardboard by binder clips to keep taught for imaging (see Figure 1).

Figure 1. Image of the sweat pants (without the use of camera filters) in the area of injury where there were also 3 parallel lines/marks.

Two red R2 filters were then affixed to the camera lens and an image was taken with the use of the ALS (see Figure 2).

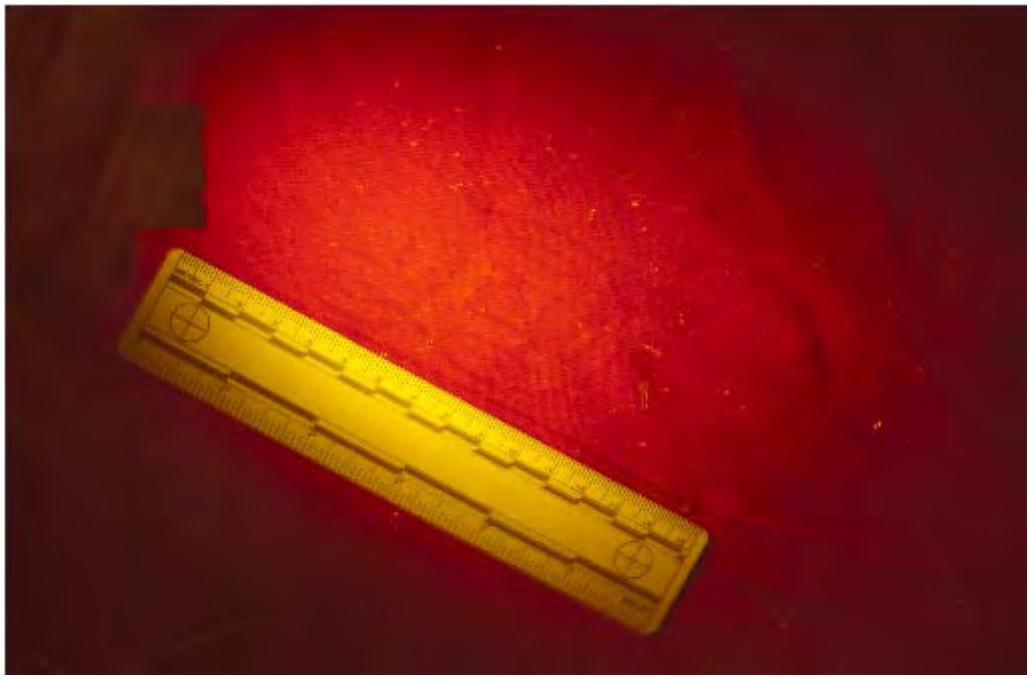


Figure 2. Image of the sweat pants in the same area using an ALS and 2 red filters with suspected logo information.

At the time of this examination the use of Photoshop® had limited use in our laboratory. In this particular case only the Levels Adjustment (0 0.13 255) of Photoshop® was used (see Figure 3).

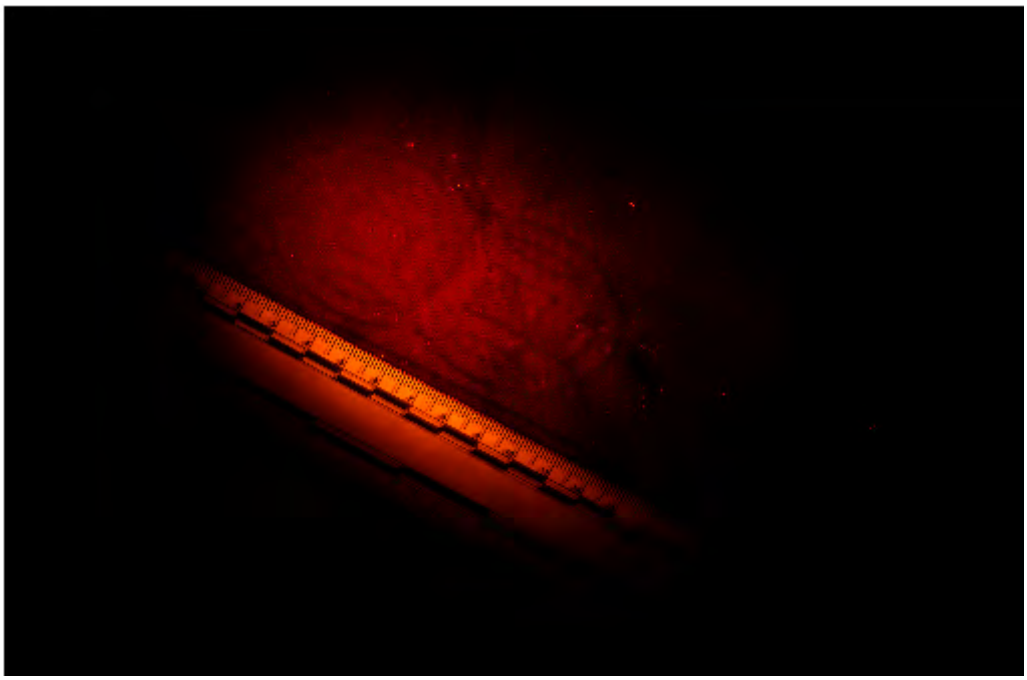


Figure 3. Image with use of 2 red filters and ALS with the Levels adjusted in Photoshp® showing the suspected logo information.

Ultimately the information in this image along with additional images of other areas of the sweat pants provided a logo and number sequence (tire size). Further checking of the internet and of tire retailers this examination was able to supply the following information in my report. "The impression located on the sweatpants is consistent with being made by the sidewall of a "Double Coin, 385/65R-22.5" tire. No determination of which model, the "RLB900" or "RR900", could be made. The types of vehicles that use these tires include heavy load dump trucks, cement mixers, and liquid carrying trailers."

Subsequent Examination of Case Example 1 with the use of Adobe® Photoshop®

The original images were used to determine if Photoshop® could be used as a more efficient way to screen the evidence. Since somewhat good information was achieved with the use of red filters and an ALS, this image will be explored first. This image was opened in Photoshop® and the RGB color channels were viewed by splitting and arranging the Channels by:
Split Channels, then Windows > Arrange > Tile (see Figure 4). An excellent way of approaching this can be seen in George Reis's book [1].

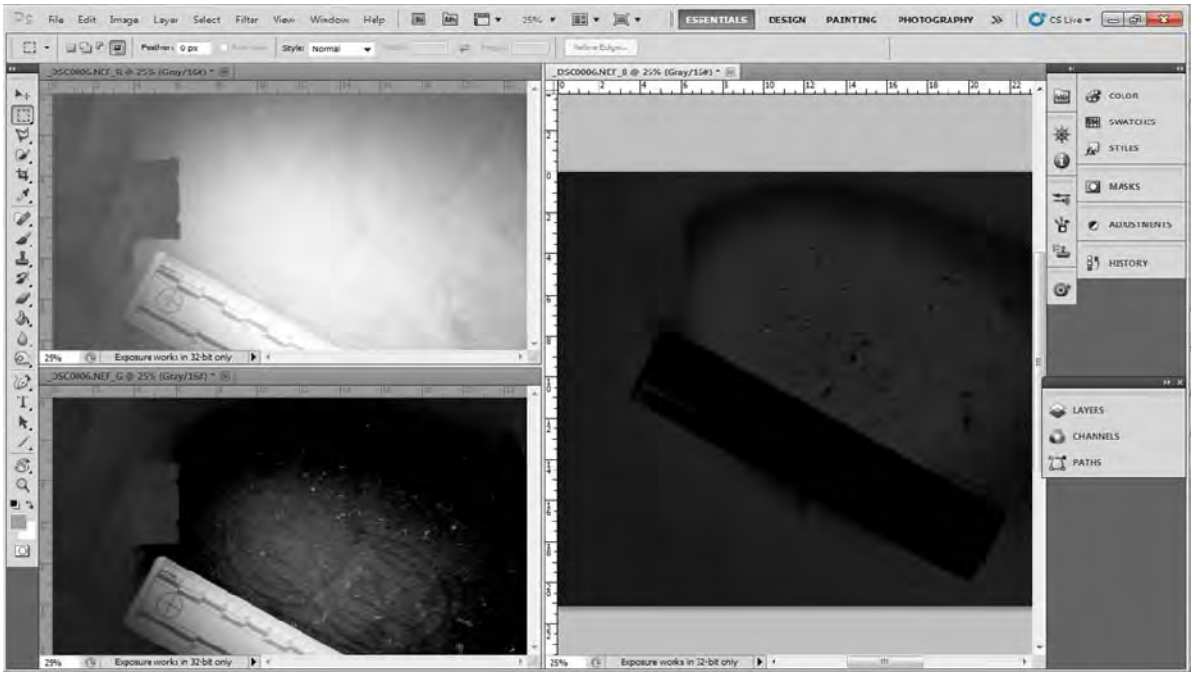


Figure 4. The RGB channels split and arranged for all to be viewed.

In looking at these results, the greatest detail can be found in the green channel with the Levels adjusted (0 0.82 87) (see Figure 5).

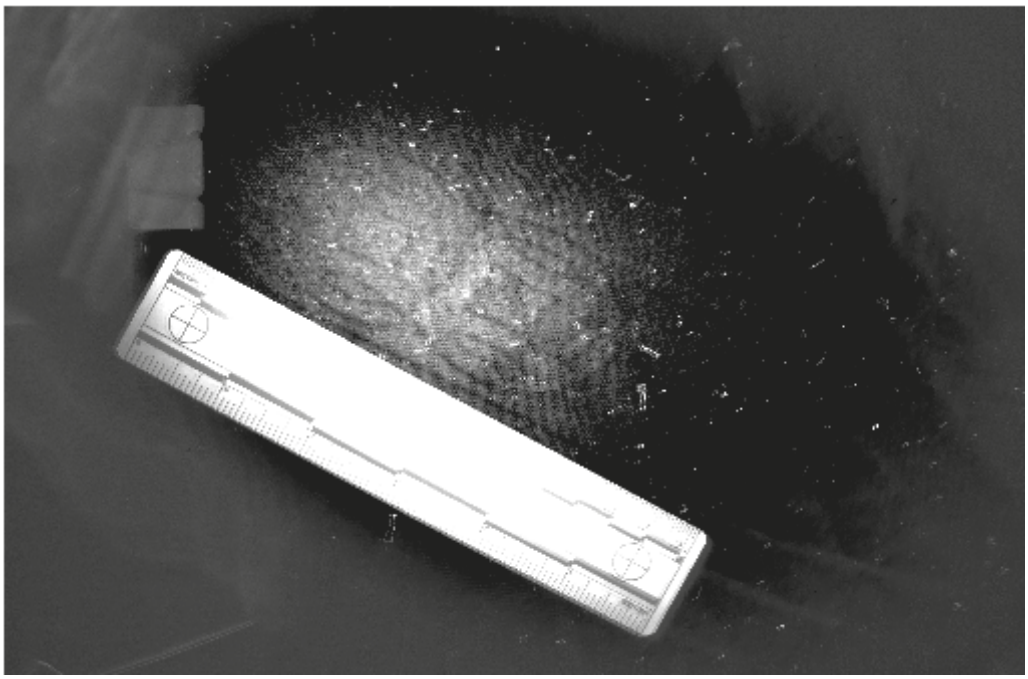


Figure 5. Green Channel with levels adjusted.

The "Original Image" (no camera filters nor an ALS were used) was also opened in Photoshop® and the RGB color mode was changed to Lab by:
Image > Mode > Lab Color
The results were viewed by splitting and arranging the Channels.
Levels for each channel were then adjusted to:
L 55 1.5 255
a 116 0.19 198
b Levels 112 0.18 175
The results were also viewed by splitting and arranging the Channels (see Figure 6).

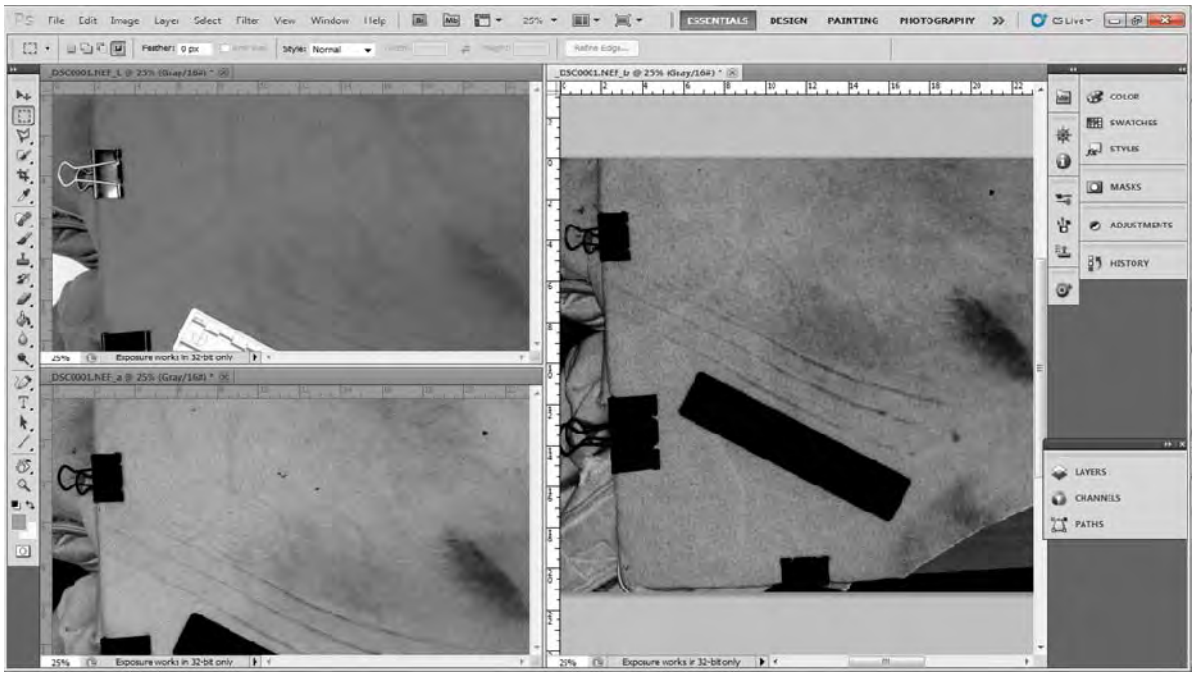


Figure 6. The Lab channels split and arranged for all to be viewed.

In looking at the results, the greatest detail can be found in the b channel. The canvas was flipped so that it could be easier to read what was present by:
Image > Image Rotation > Flip Canvas Vertical.

The information from this channel was compared to the sidewall of a suspected tire (see Figure 7).

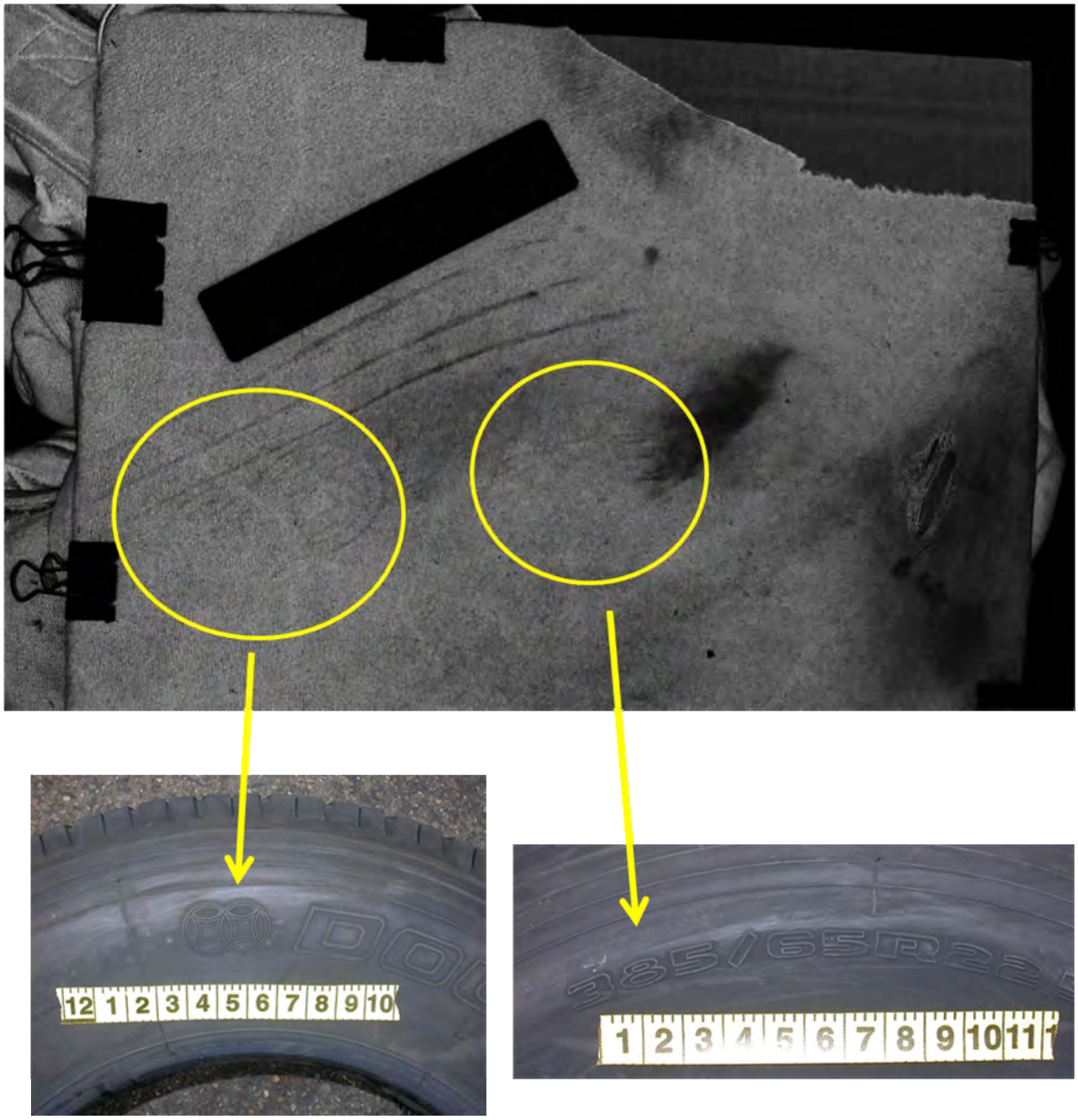


Figure 7. The b channel selected and flipped along with areas of correspondence of the impression and information from the sidewall of a suspected tire are shown.

It should be obvious that the Photoshop® enhanced "original image" provides more amount of information per image then the "ALS image". Getting this large area of the impression(s) as found in the b channel was not accomplished when this evidence was examined originally.

Case Example 2

This case involved the beating death of an individual. Injuries were throughout his body and the question was if it could be determined if there was more than one individual (shoes) involved in this crime. The evidence submitted was the victim's clothing (jeans and jacket).

The items had a large amount of blood overall. There were areas of possible impressions in blood. First, images were taken of the jeans with possible marks/impressions located below the pocket. It was unable to be determined if these impressions were from an outsole and if so, if they were from the same outsole or multiple outsoles (see Figure 8).

Figure 8. An image of the area near the jeans pocket.

The mode was changed from RGB to CMYK by:
Image > Mode > CMYK
The results were viewed by splitting and arranging the Channels (see Figure 9).

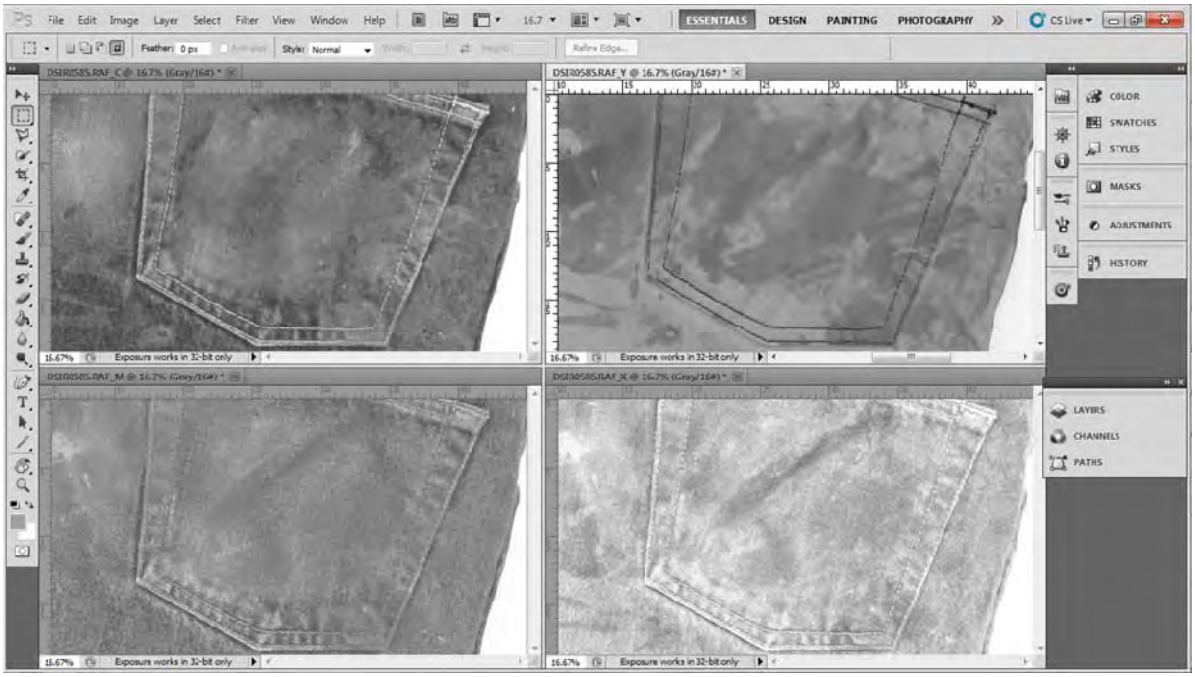


Figure 9. The CMYK channels split and arranged for all to be viewed.

In looking at the results, the greatest detail can be found in the yellow channel (see Figure 10).

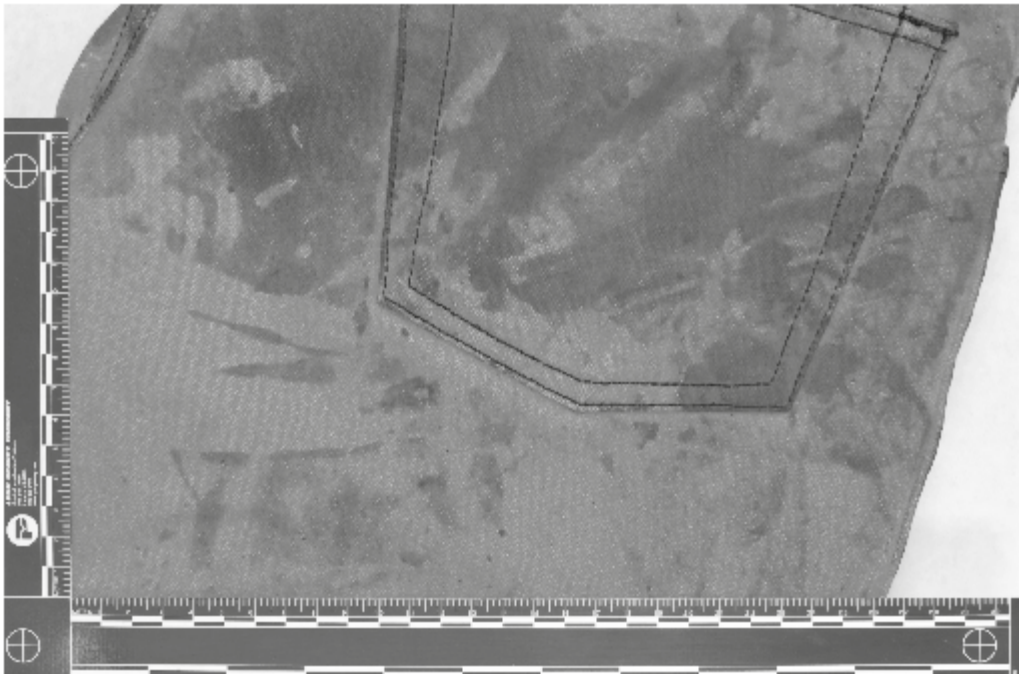


Figure 10. The yellow channel.

In the pocket area and to the lower left of the pocket, lug elements are clearly visible. To the upper right of the pocket a partial Vans outsole design is clearly visible. These simple steps were helpful in showing that there were at least 2 individuals (or 2 shoes) who/which contributed their outsole information on the victim's jeans (see Figure 11).

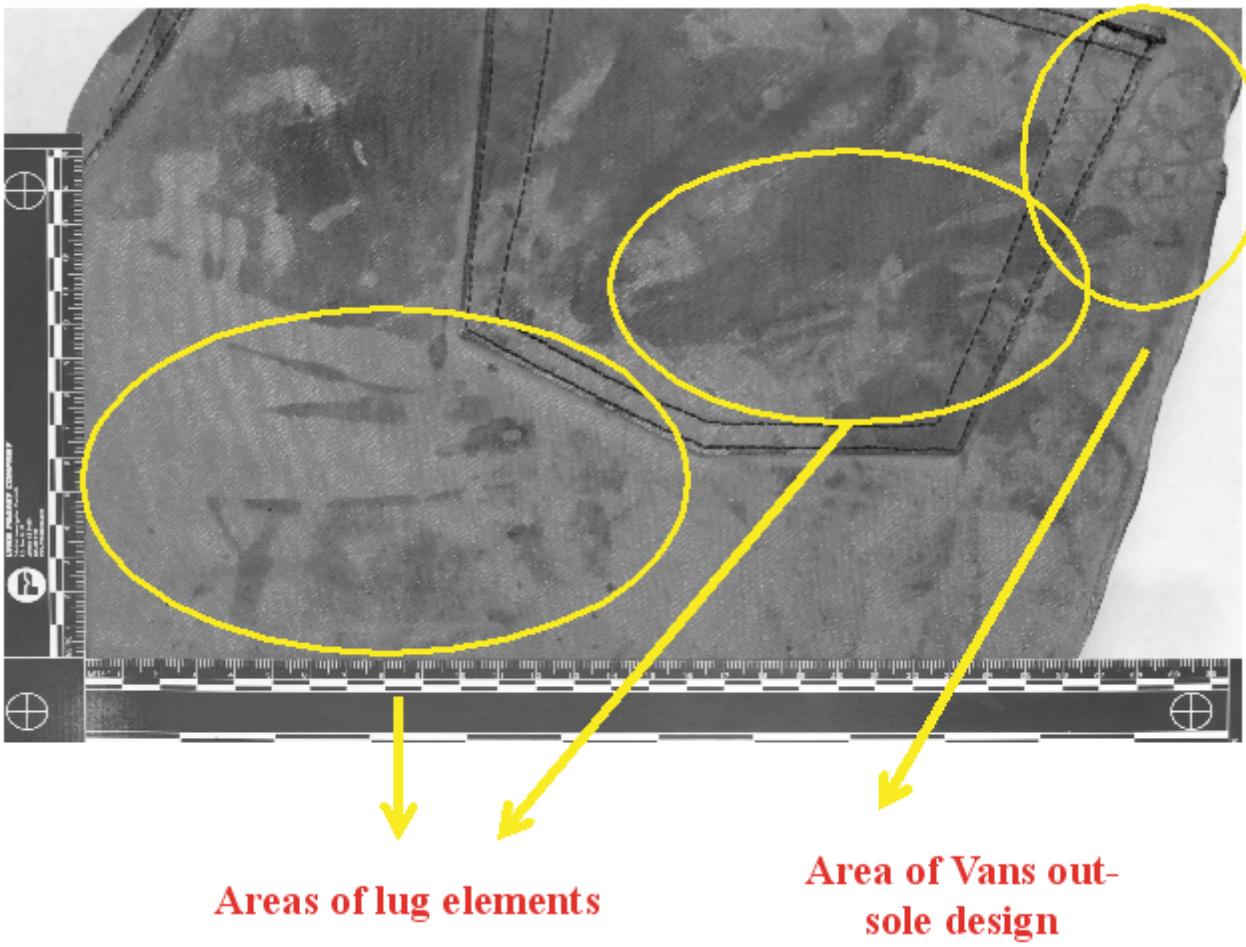


Figure 11. Areas of outsole information from the yellow channel.

Conclusions

Being comfortable in a few of the many options of Adobe® Photoshop® can provide a greater wealth of information. The 2 examples show how using the Channels from Image Modes can help you find what you couldn't "see" in a very easy, efficient and non-destructive way providing an additional technique for the scientist. As with most any technique, the amount of information that you collect is of upmost importance. Thus a high resolution camera (digital-SLR) with large file size images can provide greater clarity than a lower resolution camera (point and shoot). As technology advances, or as one becomes more adept with Adobe® Photoshop®, getting additional information other than an image will be a greater possibility.

References

[1] Reis, G. 2007. Photoshop CS3 for Forensic Professionals, Wiley Publishing Inc.

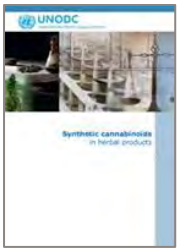
DRUG UPDATES

The Drug Enforcement Administration today commended House and Senate negotiators for agreeing on legislation to control 26 synthetic drugs under the Controlled Substances Act. These drugs include those commonly found in products marketed as "K2" and "Spice."

The addition of these chemicals to Schedule I of the Controlled Substances Act will be included as part of S. 3187, the Food and Drug Administration Safety and Innovation Act. Schedule I substances are those with a high potential for abuse; have no medical use in treatment in the United States; and lack an accepted safety for use of the drug.

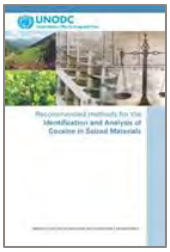
In addition to scheduling the 26 drugs, the new law would double the length of time a substance may be temporarily placed in Schedule I (from 18 to 36 months). In addition to explicitly naming 26 substances, the legislation creates a new definition for "cannabamimetic agents," creating criteria by which similar chemical compounds are controlled.

Please find the entire text of the news release here



Synthetic cannabinoids in herbal products
UNODC; 2012
Download the report here

Guidelines for the forensic analysis of drugs facilitating sexual assault and other criminal acts
UNODC; 2011
Download the report here



Recommended Methods for the Identification and Analysis of Cocaine in Seized Materials (Revised and updated)
Manual for use by National Drug Analysis Laboratories
UNODC; 2012
Download the report here

NWAFS
40th Anniversary Meeting

The Northwest Association of Forensic Scientist's annual training conference is happening September 23-28, 2012. The conference consists of technical workshops, scientific presentations and an opportunity to participate in a special research topic.

Some of the workshops include:

- Practical Accelerant Detection for Investigators and Chemists
- Forensic Evaluation of Long Range Ballistics
- Gastric Contents and Food Analysis
- Microscopy for the Non-Microscopist
- Identification of Natural Fibers
- Advances in DNA: Applied Biosystems 3500 Instrumentation

The Special Research Topics include:

- Temperature of Ejected Cartridge Cases
- Chemical Enhancement of Footwear Impressions Using Soils of the Pacific Northwest
- Primer Gunshot Residue Contamination

September 23-28, 2012
Missoula, Montana
Holiday Inn Downtown
http://www.holidayinn.com
http://www.nwafs.org

NWAFS Conference-Missoula

NEW WORKSHOP JUST ADDED!

Look for this new addition to the program:

Workshop #13: HandHeld XRF: Forensic Applications of the Innov-X System

Instructor: Edgardo Jimenez, Olympus NDT

The theory and practical use of the Innov-X hand held XRF will be discussed and presented by an application scientist from Olympus. Samples will be generated and tested to better understand the limits and forensic applications of this instrumentation. Participants are encouraged to bring samples that may be useful for in lab or field XRF analysis such as bullet ricochet, explosive debris, and inorganic chemical substances

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

Workshop Descriptions

Workshop #1: Utilizing an Accelerant-Detecting Dog for Fire Investigators and Chemists
Instructor: Rick Freier, Spokane Valley Fire Department

This one-day course will include a brief lecture about modern techniques in the detection, collection and examination of accelerants in arson investigations. The introductory lecture will be followed by an off-site live burn/suppression conducted by the Missoula Fire Department. Hands on demonstrations by an accelerant sniffing dog and on-scene evaluation to include collection of samples will be provided. This course is intended for field scene examiners who may be involved with arson scene processing and laboratory chemists who desire a better understanding of how fire scenes are evaluated in the field.

Workshop #2: Forensic Evaluation of Long Range Ballistics
Instructor: Matthew Noedel, Noedel Scientific

This half day course will cover the forensic considerations of assessing a long range trajectory evaluation. Concepts including calculation of ballistic coefficients, the environmental factors and other characteristics of long range reconstruction will be addressed. Data gathered from prior testing will be discussed and shared.

Workshop #3: Ethics in Forensic Science
Instructor: Carolyn Gannett, Gannett Forensics

This half day workshop provides tools to readily access the content of roughly two dozen forensic science ethics codes from around the world and gives individuals the opportunity to apply that content to realistic scenarios. Lecture material offers insight into the role of morals, motivations for unethical conduct. Issues surrounding filing an ethics complaint or being the subject of an ethics allegation will be discussed.

Workshop #4: Jury Selection-Do you Know your Audience
Instructors: Sharon Hedlund, Spokane County Prosecuting Attorney's Office

(Half day) Attorneys go through many levels of examination when selecting a jury. Because the forensic scientist is not usually involved in this process, learn what attorneys are looking for in jurors. Gain an understanding of how an average juror digests forensic information and what an average juror expects from an expert witness. Are you reaching your audience?

Workshop #5: Using Adobe® PhotoShop® as an Evidence Screening Tool
Instructor: Jeff Jagmin, Steve Stone, Brett Bishop Washington State Patrol Crime Lab-Seattle

This half day workshop will provide the students with techniques that can be used on contact transfer type casework (bloodstain, impression, latent print, and questioned documents) with minimal handling of the evidence. The class will introduce and demonstrate the basic features of Adobe® PhotoShop®. Students will also learn many different techniques to examine a variety of cases

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

using the Modes and Adjustment features. The students will work through numerous real casework scenarios utilizing techniques discussed in the class.

Workshop #6: Identification of Natural Fibers
Instructor: Susan K. Wilson, Ph.D.

This one day workshop will familiarize students with the microscopical and microchemical identification of various types of natural fibers which may be encountered in criminal cases. The sources, processing, and end-uses of animal, vegetable, and mineral fibers will be reviewed. Special emphasis will be given to vegetable fibers, with lectures on basic plant anatomy, plant cell wall structure, cellulose and lignin in the plant cell wall, regenerated celluloses, and correlations between botanical and textile industry fiber terms. This workshop covers the topics under chapters 8, 9, and 10 (natural fibers) of SWGMAT guidelines for Fiber training.

Target Audience: Trace Examiners of all experience levels

Workshop #7: Microscopy for the Non-Microscopist
Instructor: Susan K. Wilson, Ph.D.

Do you dread using a microscope? Do you get headaches after looking through the eyepieces for only a minute? Does your neck ache after 10 minutes? Do you wonder why sometimes your image looks fine and the next day it looks terrible? Did you bump a knob but you are not sure what that knob does so you just left it alone? Or do you just want to get better images through the eyepieces or a camera? If you answered "yes" to any of these questions, then this workshop is for you! We will cover in a few short lectures image generation with stereo and compound microscopes, different contrast enhancement methods, and the use of a simple point and shoot camera. We will spend the remainder of the time working with different types, makes, and models of microscopes to observe differences in image quality. Students will be shown different compound microscopes and determine what contrast enhancement techniques are available for that instrument. We will observe what happens to an image when Kohler illumination is not set properly, how to change the depth of focus of a sample for a photograph without changing the objective lens, and how to decrease the light level without losing resolution. You may not fall in love with microscopes by the end of this workshop, but you should feel more comfortable working with them.

Scheduling: This workshop is a ½ day workshop. Different types, makes, and models of microscopes would be appreciated for demonstration purposes.

Workshop #8: Gastric Contents and Food Analysis
Instructor: William Schneck, Microvison Northwest

The examination of gastric contents, vomit stains and food have probative value in both criminal and civil investigations. The identification of vomit stains may prove or disprove a suspect or victim alibi, support witness testimony, and help in crime scene reconstructions. Vomit traces may reveal

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

food particles that identify a specific food or meal leading investigators to a restaurant the victim may have last dined. An unusual food ingredient or an abundance of one type of food may suggest traits or food habits helpful to an investigation. Vomit may transfer from a victim to a suspect environment, i.e., clothing, dwelling or automobile. When stomach contents from a victim and foreign samples from a suspect environment are characterized and compared, similarities in food ingredients may suggest a common origin linking the suspect to the victim.

This workshop will cover the characterization of food traces by lectures and lab exercises. Commonly encountered food traces including spices, herbs, salt, sugar, starches, meat, vegetables, and fruits will be examined by light microscopy. A variety of dried stains will be tested for the presence of gastric enzymes. Simulated liquid gastric contents will be sieved and food products identified. The use of dichotomous plant cell keys, reference collections, and staining methods will be studied.

Workshop #9: Advances in DNA: Applied Biosystems™ 3500 Series Instrumentation
Instructor: Amie Ingold, Applied Biosystems; Guest: Bill Gartside Biology Unit Supervisor Wyoming State Crime Laboratory

The 3500-series instruments are the first genetic analyzers designed with a specific feature set and workflow for the Human Identification application. This workshop will outline the features, implementation and advantages of the 3500 over previous systems. Bill Gartside will be on hand to discuss how the Wyoming State Crime Laboratory validated their new system in conjunction with Applied Biosystems. Lunch and breaks will be provided by Applied Biosystems which enables this course to be offered at no cost to those choosing to attend.

Workshop #10: Solid Phase Extraction for the Forensic Scientist
Instructor: Dr. Michael J. Coyer, United Chemical Technologies Inc.

This half day workshop will teach attendees the history, theory, and method development procedures involved with solid phase extractions and provide an in-depth discussion of all available sorbent types and their chemistry. The use of mechanisms to improve selectivity and recovery will be included. New and innovative applications will be presented and discussed. Special attention will be given to the analysis of Benzodiazepines and metabolites, THC, THCA, and Synthetic Cannabinoids. This workshop will also discuss the validation of SPE methods for GC-MS and LC-MS/MS technologies. A review of challenging matrices will be presented. The workshop is 100% free of marketing bias!

Workshop will appeal to toxicology staff willing to learn about the chemistry, principles, and applications of Solid Phase Extraction (SPE) with regard to forensic toxicology, To learn about the applications of SPE in terms of newer drugs and metabolites and to learn about validation of SPE methods in terms of GC-MS and LC-MS/MS

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

Workshop #11: Basic Understanding of Bloodstain Pattern Analysis for the Bench Scientist
Instructor: Karen Green, Green Forensics

This 1 day class will introduce Bloodstain Pattern Analysis (BPA) for those who may see this type of evidence in their work on the bench. The class will introduce how to recognize and documents some basic patterns such as castoff, drip, contact, transfer and projected. The students will be given scenarios on how to document and what is required to document.

Workshop #12: Bath Salts: New Synthetic Cathinones
Instructor: Brianna Peterson, Washington State Patrol Crime Laboratory

This half day workshop will focus on the new designer stimulant drugs, commonly known as "Bath Salts". In the last few years, there has been a dramatic rise in the use of designer synthetic drugs. Designated as legal drugs, these compounds are often more potent than the scheduled stimulant drugs they were designed to imitate pharmacologically. Topics of the workshop will include federal scheduling, basic pharmacology, analytical methodology, observed clinical effects, prevalence in DUI and death cases, and adverse effects of synthetic cathinones.

Workshop #13: HandHeld XRF: Forensic Applications of the Innov-X System
Instructor: Edgardo Jimenez

The theory and practical use of the Innov-X hand held XRF will be discussed and presented by an application scientist from Olympus. Samples will be generated and tested to better understand the limits and forensic applications of this instrumentation. Participants are encouraged to bring samples that may be useful for in lab or field XRF analysis such as bullet ricochet, explosive debris, inorganic chemical substances.

Wednesday KEYNOTE ADDRESS: Lessons in Crime Scene Processing: Comparing Crime Scene Processes in Active War Zones-versus-Controlled Domestic Scene Processing

Special guests will present their experiences in processing crime scene from active war zones. The unique environment of a war zone necessarily means that a different approach to crime scene response must be considered. These presentations will provide the audience with first hand experiences of forensic scientists who have experience in processing crime scenes in war zones.

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

Special Research Workshop Topics

Special Research workshops are small, focused, one-day projects that conduct baseline research on a selected forensic question. The observations and data generated will then be presented during the general session at the end of the week and formally published (after peer review) in the NWAFS Crime Scene publication. Each member of the work group will be under the direction of the Mentor and will contribute to setting up, recording and preparing the research for presentation/publication.

The end product will list as co-authors the name of each participant.

Special Research Workshop #1: Temperature of Ejected Cartridge Cases

Mentor: Matthew Noedel, Noedel Scientific

The temperatures of fired cartridge cases just after ejection from a semiautomatic action will be studied and reported. Variables may include caliber and number of successive shots.

Special Research Workshop #2: Chemical Enhancement of Footwear Impressions Using Soils of the Pacific Northwest

Mentor: Jeff Jagmin, WSP Crime Lab; Chris Hamburg, OSP Forensic Division

Footwear impressions using soils of various regions of the Pacific Northwest will be pre pared. These impressions will then be enhanced using chemical methods such as ammo nium/potassium thiocyanate, bromophenol blue, and others. These impressions will be photographed and evaluated to determine if a specific chemical enhancement is better for different regions.

Special Research Workshop #3: Primer Gunshot Residue Contamination

Mentor: Annalivia Harris, Montana State Crime Lab

This research group will evaluate law enforcement environments (such as police cars and Officer duty belts) for the presence of GSR particles. Further, the potential for these sources to secondarily contaminate otherwise clean hands will be examined.

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

Request to Participate Special Research Topics

Name _____

Agency _____

Address _____

_____

Phone_____ Email _____

IF YOU WOULD LIKE TO BE CONSIDERED FOR SELECTION TO PARTICIPATE IN A SPECIAL RESEARCH PROJECT, PLEASE COMPLETE THIS FORM AND FORWARD TO MATTHEW NOEDEL VIA EMAIL AT MNOEDEL@ATT.NET.

IF YOU HAVE AN IDEA FOR A SPECIAL RESEARCH TOPIC OR WANT TO MENTOR A PROJECT, PLEASE PREPARE AN OUTLINE OF THE RESEARCH AND METHODS AND FORWARD TO MATTHEW NOEDEL VIA EMAIL AT MNOEDEL@ATT.NET.

Additional topics will be considered for approval upon submission.

Special Research Workshop Topics		With Meeting Registration	Without Meeting Registration	TOTAL
Workshop fees are offered at a reduced cost if the participant (Member or Non-member) registers for the full meeting.				
Special Research Workshop 1: Temperature of Ejected Cartridge Cases	Monday, 9/24, 8:00 - 5:00	$25	$75	
Special Research Workshop 2: Chemical Enhancement-Footwear	Monday, 9/24, 8:00 - 5:00	$25	$75	
Special Research Workshop 3: Primer GSR Contamination	Monday, 9/24, 8:00 - 5:00	$25	$75	
☐ Total Special Research Workshop Registration – Paid Online ☐ Total Special Research Workshop Registration – Check Enclosed				

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT

REGISTRATION FORM

Name _____

Agency _____ NWAFS Member: Yes ☐ No ☐

Address _____

Phone _____ Email _____

Full Meeting Registration	**MEMBER**	**NON-MEMBER**	**TOTAL**
Includes conference binder, admission to the general scientific sessions and breaks, Wednesday Vendor Reception, lunch T-Th, Thursday banquet.	$275	$375	

Workshop Registration		**With Meeting Registration**	**Without Meeting Registration**	**TOTAL**
Workshop fees are offered at a reduced cost if the participant (Member or Non-member) registers for the full meeting. Price includes lunch and breaks.				
Special Topics— See prior pages for detail	Monday, 9/24, 8:00 - 5:00	Please submit form		
#1 Arson Workshop	Monday, 9/24, 8:00 - 5:00	$35	$125	
#8 Gastric Contents Exam	Monday, 9/24, 8:00 - 5:00	$35	$125	
#11 Basic Bloodstain Patterns	Monday, 9/24, 8:00 - 5:00	$35	$125	
#2 Long Range Ballistics—AM	Tuesday 9/25, 8:00 - 12:00	$35	$75	
#3 Ethics--AM	Tuesday 9/25, 8:00 - 12:00	$35	$75	
#5 Photoshop--PM	Tuesday 9/25, 1:00 - 5:00	$35	$75	
#12 Forensic Exam of Bath Salts--PM	Tuesday 9/25, 1:00 - 5:00	$35	$75	
#6 ID of Natural Fibers	Tuesday 9/25 8:00 - 5:00	$35	$125	
#9 3500 DNA Validation	Tuesday, 9/25, 8:00 - 5:00	Free	Free	
Keynote: Crime Scenes in War Zones-Processing Under Fire	Wednesday, 9/26, 8:00-11:00	Free	Free	
Lunch--VENDOR FOCUS Wednesday, 9/26, 11:00-1:00				
#10 Solid Phase Extraction	Wednesday, 9/26, 1:00 - 4:00	$35	$75	
#4 Jury Selection	Wednesday, 9/26, 1:00 - 5:00	$35	$75	
#7 Microscopy for Bench Scientist	Wednesday, 9/26, 1:00 - 5:00	$35	$75	
#13 Handheld XRF	Wednesday, 9/26, 3:00 - 5:00	$35	$75	
☐ Total Meeting and Workshop Registration – Paid Online ☐ Total Meeting and Workshop Registration – Check Enclosed				

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

NWAFS CONFERENCE PAYMENT OPTIONS

Pay by Check or Online (*No Purchase Orders Please*). Checks should be made out to "NWAFS":

NWAFS Fall 2012
c/o Heather Campbell
ISP-Forensic Services
700 S. Stratford Dr.
Meridian, ID 83642

NWAFS Tax ID 94-2923358

Additional Information/payment available online at:
www.nwafs.org

Meeting Details

Full Meeting Registration: Full meeting registration entitles you to attend the scientific presentation session on Thursday and Friday, September 27th and 28th; provides a welcome registration bag with conference packet including a program, provides access to the NWAFS hospitality suite in the evening after the technical session, provides lunch on Tuesday, Wednesday and Thursday, provides admission to the Vendor Reception and door prizes; provides a ticket to the dinner banquet on Thursday night.

*****Full meeting registration entitles you to use the discounted rate for workshops*****

HOTEL DETAIL

The conference will be held at the Holiday Inn-Missoula Downtown, Missoula, MT. You must contact the hotel directly for your room reservations **NO LATER THAN August 22, 2012**. Call their reservation line and specify the NWAFS rate of **$87/night**. Internet is included with your room reservation!

Call: 406-721-8550
Online: http://www.holidayinn.com

Fly into Missoula Airport: Depending on the time of day, it will take from 25 to 50 minutes to get from the airport to the hotel. Car rental or shuttle options should be arranged!

For driving directions Google the location.
Holiday Inn Missoula Downtown
200 South Pattee
Missoula, MT 59802

http://www.holidayinn.com/hotels/us/en/missoula/msumt/hoteldetail/directions

NWAFS Seminar
September 23-28, 2012
Holiday Inn Downtown, Missoula, MT
http://www.holidayinn.com

NWAFS Trailer Park Tribute Thursday September 27th, 2012

6PM-10PM

Come one, come y'all!
Depict your impression of your trailer park roots!

WIKIPEDIA Defines Trailer Park: ***Trailer parks, especially in American culture, are stereotypically viewed as lower income housing whose occupants live at or below the poverty line, have low social status and lead a desultory and deleterious lifestyle. Despite the advances in trailer home technology, the trailer park image survives, evidenced with stereotypical ignorance in a statement by Presidential adviser James Carville in the course of one of the Bill Clinton White House political scandals, "Drag $100 bills through trailer parks, there's no telling what you'll find".***

It is also seen in the Canadian mockumentary Trailer Park Boys

SEEKING SOIL SAMPLES!

Chris Hamburg and Jeff Jagmin request your assistance! We will be participating in a special research workshop at our upcoming NWAFS meeting and are in need of soil samples. We will be making footwear impressions with these soils and attempt to enhance the impressions using chemical methods such as potassium thiocyanate and bromophenol blue.

We know that many of our members will be vacationing/camping in many areas around the Pacific Northwest and we would request approximately one-gallon of soil for you to collect and submit to us. If not traveling far this year we would still request samples from near your local region or laboratory.

What we desire is the soil (not the leaf liter or extra debris) along with information of where the sample was collected and brief description of the natural environment. Examples of the information could be something like:

Seattle, Washington
Sample collected from a sparse grassy area under a maple tree next to road by the WSP laboratory
N 47° 34' 59.8" W 122° 19' 22.2" (optional)

Methow, Washington
Sample consisting mostly of fine rock and sand collected from approximately 100 feet from the Methow River.

If you want you could even take a picture of the area from where you are collecting the sample(s). These samples can be collected in a one-gallon zip-lock plastic bag and packaged up for mailing and submitted to:

Jeff Jagmin
2203 Airport Way South, Suite 250
Seattle, WA 98134

MEETING ANNOUNCEMENTS

IAI 97th Educational Conference
Forensics in Phoenix 2012
July 22 - 28, 2012
Phoenix, AZ
www.theiai.org

Impression and Pattern Evidence Symposium
August 6-9, 2012
Clearwater Beach, FL
https://www.forensiccoe.org/ipes/CFP/Default.aspx

IABPA
October 2-5, 2012
Tucson, AZ
http://www.iabpa.org/2012-conference

Midwestern Association of Forensic Scientists
41st Annual Meeting
September 24-28, 2012
Milwaukee, WI
www.mafs.net

Southwest Association of Forensic Scientists
2012 Conference
October 22-26, 2012
Scottsdale, AZ
http://www.swafs.us/

NORTHWEST SUMMERER AMUSEMENTS

The 15th Annual
Elephant Garlic Festival
August 10 - 12
North Plains, OR
www.funstinks.com

PDX Adult Soap Box Derby
August 18
Portland, OR
http://www.soapboxracer.com/

23rd Annual Scappoose
Sauerkraut Festival
September 15
Scappoose, OR
http://
www.scappoosecommunity.org/
scappoose-communityclub-
sauerkraut-festival/

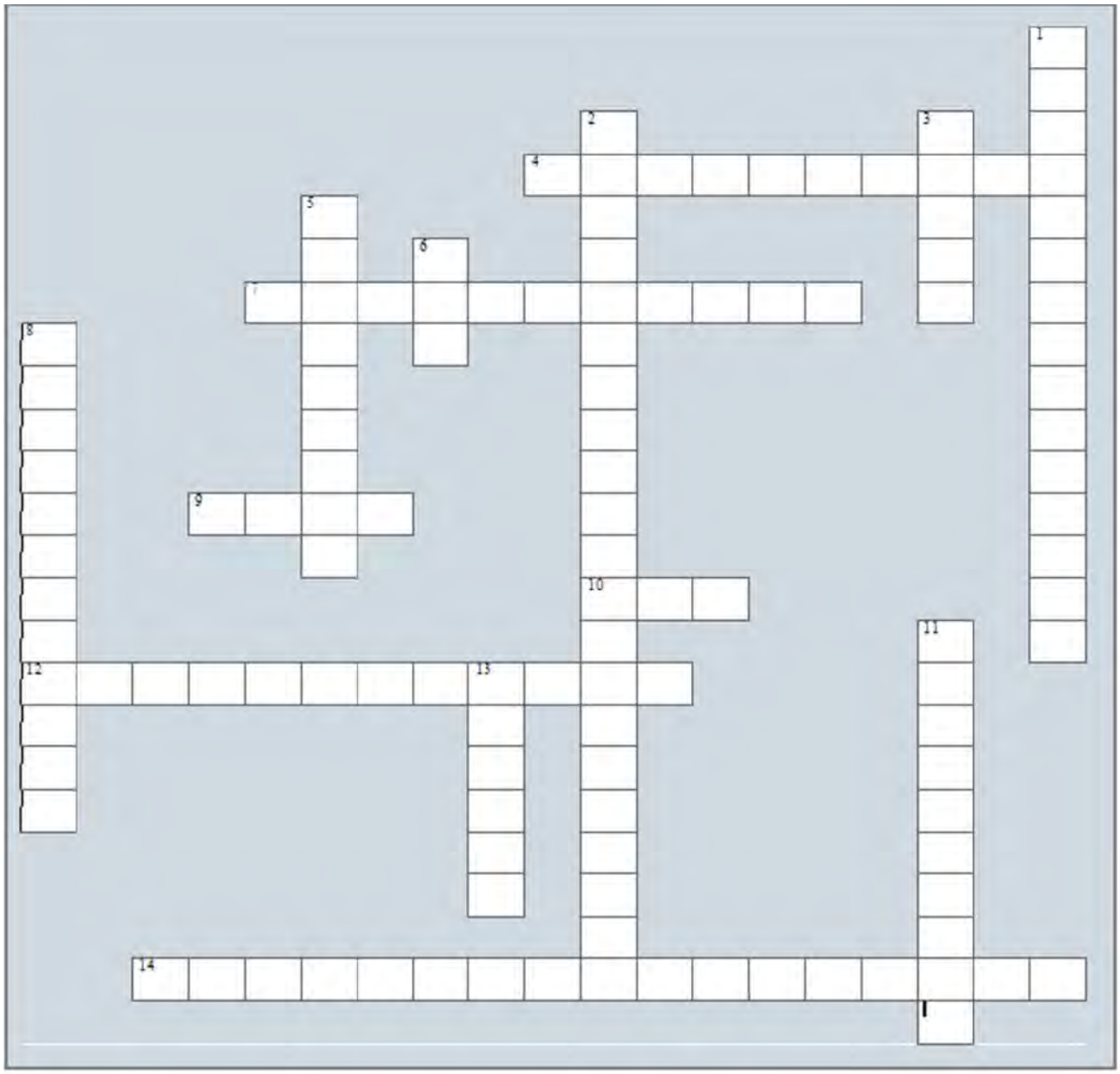
Pig Out in the Park
August 29 - September 3
Riverfront Park
Spokane, WA

spokanepigout.com

The Puyallup Fair
September 7 - 23
Puyallup, WA
ww.thefair.com

Forensic Science Puzzler
DNA Edition

by Jennifer Malone



Across

4. A person who has two copies of the same allele, one on each chromosome, at a single locus.

7. A sample collected by rubbing a sterile swab on the inside of the mouth or cheek.

9. A section of DNA that contains the genetic information contained in the DNA of an organism.

10. The molecule that carries genetic information.

12. A person who has two different alleles, one of each chromosome, at a single locus.

14. A method of DNA analysis that examines the DNA in mitochondria.

Down

1. A statistical method of combining the likelihood ratio with additional information to produce an overall estimate of the strength of a piece of evidence.

2. Roughly the amount of skin cells shed per day by the average human.

3. A specific area, or site, on a chromosome.

5. DNA that is transferred via skin cells when an object is handled or touched.

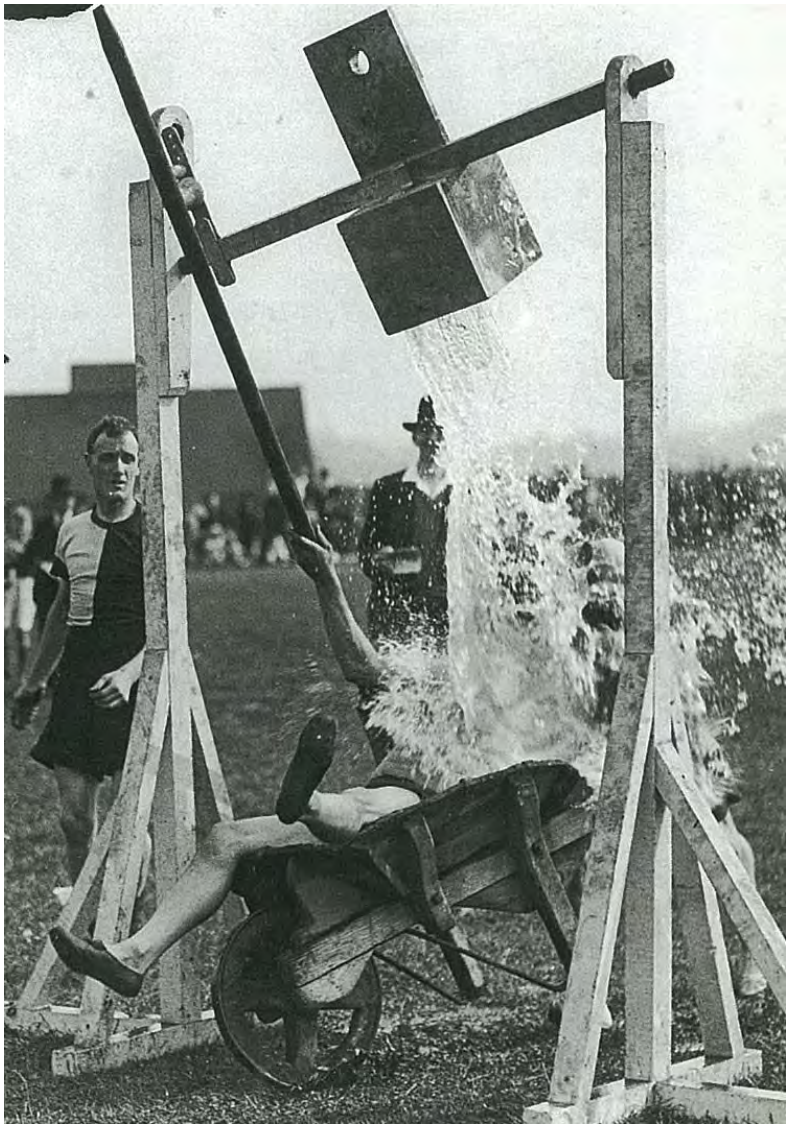
6. A method for increasing small amounts of DNA into an amount that can be more easily analyzed.

8. Having multiple forms of an allele at a locus within a population.

11. The base unit of DNA.

13. The complete set of genetic information contained in the DNA of an organism

CAPTION THIS!



The best caption submitted for this photo will win a $25 gift card of your choice!

editor@nwafs.org

CAPTION THIS WINNER!

Congratulations to our last newsletter's winner:

Mark Strongman
Washington State Patrol

"Little did anyone know that in his early years, Angus Young was heavily involved in the judicial process until that fateful day when he discovered sponsoring charity balls was more rewarding."

Runner up goes to:

Aaron Brudenell
Arizona Department of Public Safety

"In a tactic now discredited by the modern American judiciary, witness selection in the trial of Bruno Hauptmann, ultimately convicted of the kidnapping and murder of the Lindbergh baby, was conducted by a paralegal selected based on his resemblance to the victim in the case."

FREE REGISTRATION!

Got an interesting technical note, informative article or research project?

Make a submission to the NWAFS newsletter, and you could win FREE REGISTRATION to an upcoming NWAFS meeting!

The officers vote for the "Best Independent Newsletter Submission" once per year and award a FREE REGISTRATION to the winner.

NWAFS REGISTRATION

ADMIT ONE

THIS COUPON NOT VALID FOR FREE REGISTRATION
ONLY ONE WINNING AUTHOR PER SUBMISSION
EXPIRES 3 YEARS FROM AWARD

Help keep the NWAFS newsletter interesting and informative by sending your submissions to:

Jeff Jagmin, NWAFS Editor
Jeff.Jagmin@wsp.wa.gov
2203 Airport Way South
Seattle, WA 98134
206.262.6109