

## JFI Abstracts from 2014-2017

### A Pilot Study to Analyze the Uniqueness of Anterior Teeth Using a Novel Three-dimensional Approach

**Author(s):** Chong, Gabriel T.F.; Forgie, Andrew H.

**Type:** Correction

**Published:** 2017, Volume 67, Issue 4, Page 477

**Abstract:** On page 369 of the July–September 2017 issue of the Journal of Forensic Identification (volume 67, issue 3), the caption for Figure 5 incorrectly indicated that the figure was an upper model when in fact it was a lower model, as indicated below. The authors and editor apologize for this error and extend our appreciation to IAI member William E. Silver, DDS, DABFO for bringing this error to our attention. (Read the article here)

### Detection and Identification of a Latent Palmprint on a Cartridge

**Author(s):** Waldron, Michelle E.; Walls, Adrienne

**Type:** Case Report

**Published:** 2017, Volume 67, Issue 4, Pages 479-487

**Abstract:** In crime scene work, fragments of latent prints are occasionally detected on cartridges. The development or observance of identifiable latent prints on cartridges is a less frequent occurrence. Furthermore, the authors are unaware of an instance to date when an identifiable palmprint has been developed on a cartridge. This case involved the development of friction ridge detail on a cartridge that was removed from a weapon near a suspect. The person who developed the print and the examiner initially believed the latent print to be from a finger. This case will explore how the examiner was ultimately able to identify the latent print to the palm of the suspect. (Read a correction here)

### Determining the Length of Time Required for Ninhydrin Development

**Author(s):** Pires, Cristina

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 4, Pages 488-497

**Abstract:** Latent print development procedures for porous substrates typically call for the use of ninhydrin. The literature suggests that adding heat and humidity will speed up the reaction, however, there is no consensus on how much heat or humidity to add or how long to wait for full development. Currently, the procedures at the New York Police Department Laboratory require an analyst to wait approximately 24 hours to evaluate the results after applying ninhydrin and adding heat and humidity to the porous substrates for development. This study aimed to determine whether the 24-hour wait currently in place was appropriate or whether it should be reduced or extended. Eight different porous and semiporous substrates with prints deposited by 11 different donors were examined. No additional development occurred after the initial examination immediately after the addition of heat and humidity to the substrates.

### Human Remains Detection: Validity of RCMP Dog Training using Donated Human Remains through the Nova Scotia Medical Examiner Service

**Author(s):** Dilkie, Natasha A.; Veniot, Brian J.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 4, Pages 498-518

**Abstract:** Preliminary development and training began in 2015 to evaluate a human remains donation procurement and dog training program in the province of Nova Scotia with a specific Royal Canadian Mounted Police handler and dog team. Human remains were donated through the procurement program at the Nova

Scotia Medical Examiner Service. The human remains specimens were introduced to the human remains detection dog through scent box training and field searches. Specimens were categorized by method of concealment: above surface, under water, buried, or hanging. The team's ability to accurately detect the donated human specimens was evaluated under various weather conditions, search terrains, and varying stages of decomposition. A total of 266 training sessions were conducted during this initial development stage, of which 16 sessions resulted in false positive indications, demonstrating a training success rate of 94%.

## Long-Term Preservation of Biological Evidence with Commercial Off-the-Shelf Preservatives

**Author(s):** Bathrick, Abigail S.; Mealy, Jamia L.; Cavanaugh, Sarah E.; Davoren, Jon M.; Cunningham, Heather M.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 4, Pages 519-535

**Abstract:** The preservation of biological evidence from environmental degradation following collection is necessary to maintain quality DNA for forensic casework; however, many current collection substrates do not incorporate preservation methods to protect samples that may be stored for indefinite periods of time. The goal of this study was to identify commercial off-the-shelf (COTS) preservatives that could preserve biological forensic evidence. Five preservatives were investigated: sodium azide, EDTA, parabens, propyl gallate, and zinc. Real-time and accelerated aging studies were performed to determine whether the use of COTS preservatives would reduce the risk of DNA degradation in blood, saliva, semen, and vaginal cell samples on cotton swabs and ultimately improve STR profile quality. The results of this pilot study indicated that COTS preservatives could be used to protect DNA from degradation. In particular, the sodium azide-, EDTA-, and zinc-treated saliva and vaginal cell samples generated profile quality scores that demonstrated statistically significant increases when compared to the untreated control samples. The blood and semen samples demonstrated consistent profile quality scores across all time points regardless of preservative application, indicating inherent stability within these sample types.

## Study to Determine a Procedure for Developing Latent Prints on Carbon Paper

**Author(s):** Deschamps, Andrew

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 4, Pages 536-547

**Abstract:** Although one might think carbon paper is obsolete, this paper product (used as a packaging for controlled substances) has been commonly submitted to the New York City Police Department Police Laboratory for latent print processing. Because of the lack of published research on this specific substrate, a small study was carried out to determine an effective and efficient procedure for the development of latent prints on carbon paper. Cyanoacrylate fuming followed by the application of 1,2-indanedione-zinc chloride or ninhydrin followed by the application of RAM dye stain developed significantly more detailed results than other procedures tested in this study.

## Ethylene Vinyl Acetate Outsoles and Acquired Characteristics

**Author(s):** Bily, Christopher; Mathias, Catherine

**Type:** Article

**Published:** 2017, Volume 67, Issue 4, Pages 549-564

**Abstract:** TOMS Shoes use ethylene vinyl acetate (EVA) in the production of the outsoles of their footwear. TOMS Women's Classics and TOMS Men's Classics with well-worn outsoles are of particular forensic interest. When the tread is worn away, the outsoles undergo elastic deformation when they are subjected to pressure. Outsoles resulting in elastic deformation can acquire the physical characteristics of some substrates with which they come into contact. These acquired characteristics dissipate quickly. Caution should be exercised when examining questioned impressions that may have been produced by footwear with EVA outsoles, particularly TOMS Men's and Women's Classics. These impressions may contain characteristics that are not represented in

the outsoles of the known footwear. These characteristics could be misinterpreted as class characteristics or randomly acquired characteristics in questioned impressions and result in erroneous exclusions.

## Ridge Density as an Investigative Tool for Stature

**Author(s):** Brazelle, Shelly; Carbone, Alyssa; Fleming, Kristen

**Type:** Article

**Published:** 2017, Volume 67, Issue 4, Pages 565-580

**Abstract:** It has been reported that epidermal ridge density can be used to determine gender. However, gender determination may not be useful as an investigative tool for solving crimes, because the majority of crimes are committed by males. The current study examines the correlation between stature and epidermal ridge density. Fingerprint cards from 173 African American males aged between 18 and 65 years were analyzed. The epidermal ridge density (ridges/25 mm<sup>2</sup>) was calculated for the radial region of each finger recorded. A statistically significant correlation between stature and epidermal ridge density was found ( $p < 0.01$  for right ring finger,  $p < 0.001$  for all other fingers). The study also generated linear regression equations for stature estimation that were based on epidermal ridge density. The application of the linear regression equations establishes that each increase by one ridge per 25 mm<sup>2</sup> within a fingerprint results in a decrease in predicted stature of 0.50 to 0.74 inches ( $p < 0.01$  for right ring finger,  $p < 0.001$  for all other fingers). The reported data expands the understanding of epidermal ridge density and stature, leading to a new potential investigative tool.

## Ability of Bluestar Forensics and Luminol to Reveal Latent Bloodstains Exposed to Extreme Outdoor Conditions

**Author(s):** Gardner, Edward T.

**Type:** Article

**Published:** 2017, Volume 67, Issue 4, Pages 581-599

**Abstract:** At outdoor crime scenes, blood evidence that is vulnerable to natural elements can reasonably be expected to suffer from degradation or destruction. Two chemiluminescent formulas, Bluestar Forensics and luminol, were used in an attempt to locate latent bloodstains from outdoor scenes following a lengthy period of time in Iraq and Afghanistan. Testing included a staged site and crime scenes that had been exposed to extreme conditions including massive sand storms, rain, high winds, and intense heat. Following exposure ranging from 31 days to almost 6 months, latent bloodstains were successfully located using Bluestar Forensics and luminol, including chemiluminescent reactions from mud and beneath standing water.

## Anatomical Taphonomy at the Source: Alterations to a Sample of 84 Teaching Skulls at a Medical School

**Author(s):** Pokines, James T.; Appel, Nicollette; Pollock, Corey; Eck, Christopher J.; Maki, Amanda G.; Joseph, A. Skylar; Cadwell, Lindsey; Young, Christina D.

**Type:** Article

**Published:** 2017, Volume 67, Issue 4, Pages 600-632

**Abstract:** Osseous anatomical teaching specimens have the potential to be submitted for forensic examination if they are divorced from their original context and turned in to or seized by law enforcement. A likely source for some of these remains is a medical school, where students routinely examine human skulls to study anatomical structures. The original preparation of these skulls and the effects of repeated manipulation leave behind multiple taphonomic alterations. To determine the taphonomic characteristics of former anatomical teaching skulls, a sample of 84 currently in use at the Boston University School of Medicine was examined for a broad suite of traits. Taphonomic characteristics that can be used to distinguish former anatomical teaching skulls include the presence of mounting hardware, drilling, regular vault sectioning, plastic reconstruction, pen and pencil markings, labeling, patina buildup from handling, and shelf wear. These characteristics may be used to distinguish skulls from this source from other common sources that end up under forensic examination, including former trophy, ritual, or cemetery skulls, even in cases where the skull has been later repurposed for ritual or display.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2017, Volume 67, Issue 4, Page 636

**Abstract:** Everyone has heard that primates have friction ridge detail. Here are great photographs of a baboon's feet.

## Re: A Case of Striking Sibling Similarity and a Scene Impression J. For. Ident. 2017, 67 (2), 176–179.

**Author(s):**

**Type:** Correction

**Published:** 2017, Volume 67, Issue 3, Page 305

**Abstract:** The table of contents for volume 67, issue 2, failed to list this case report by Heidi Eldridge. I point this out to the readers at this time so that the article is not overlooked. I apologize to the readers and especially to the author for my oversight.

## Re: XCAT (Capillary Analysis Test) Validation Study: Practical Field Use of Presumptive Gunshot Residue Test. J. For. Ident. 2016, 66 (4), 319–325.

**Author(s):**

**Type:** Letter to the /Editor

**Published:** 2017, Volume 67, Issue 3, Pages 306-311

**Abstract:** Upon review of the article, we found several technical inconsistencies as well as unfounded conclusions. (Read the article here)

## A Preliminary Evaluation of the Use of Gun Bluing to Enhance Friction Ridge Detail on Cartridge Casings

**Author(s):** Morrissey, J.; Larrosa, J.; Birkett, J.W.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 3, Pages 313-322

**Abstract:** Friction ridge detail was enhanced on fired and unfired 9 mm brass Luger ammunition casings using three techniques, two involving gun blue reagent at a concentration of 50% v/v. Fingermarks were deposited on 90 ammunition casings, and half were discharged using a Glock 19 semiautomatic pistol. Mark development was achieved using either superglue fuming followed by basic yellow 40 fluorescent dye staining (SG -> BY40), superglue fuming followed by gun blue (SG -> GB), or gun blue (GB) as a single process. All three processes developed ridge detail on both fired and unfired casings. The results of this preliminary work show that the use of gun blue as a single enhancement technique was able to enhance ridge detail of the highest quality and clarity, particularly on fired casings, making it the most effective process.

## Lens Testing: Reassessing the 50 mm Rule

**Author(s):** Rimmasch, P.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 3, Pages 323-340

**Abstract:** Generations of forensic science practitioners have been trained to use a 50 mm lens for crime scene and evidence photography because the 50 mm focal length is considered the "normal" lens for the once

dominant 35 mm film format and thus historically offered the most distortion-free images. However, in this age of digital photography, this paradigm may not necessarily hold true because of the varying sizes of digital camera sensors. Using a focus test chart with a grid or dot pattern, photographers can systematically test their equipment to determine what the "normal" lens is for their particular camera and lens combination. This activity was deemed prudent by our study because the 50 mm lens did not always produce digital images that were free of distortion.

## Using Bluestar Forensic to Detect Latent Bloodstains under Coats of Paint

**Author(s):** Pettolina, M.; Rainey, J.; Sanchez, R.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 3, Pages 341-353

**Abstract:** The purpose of this experiment was to determine whether Bluestar Forensic was capable of detecting latent bloodstains under multiple coats of paint. In order to test this, three different bloodstain patterns (handprint transfer, drip, and hair swipe) were applied to three types of substrates (brick, flakeboard, and dry wall). After each of the bloodstains had been applied to the substrates, the stains were systematically painted over multiple times with three separate colors and types of paint. After each coat of paint was applied and allowed to dry, Bluestar Forensic was then sprayed over the test areas to see whether a reaction occurred with the concealed bloodstain. Reactions were visualized, recorded, and photographed. The findings of this study show that Bluestar Forensic was able to detect bloodstains through at least three to four layers of paint in most circumstances. However, results did vary and were dependent upon the type and color of paint used as well as the bloodstain pattern applied.

## Can Dry Bloodstains Provide a Source for a Blood-Contaminated Fingerprint?

**Author(s):** Geller, B.; Volinits, Y.; Wax, H.

**Type:** Case Report

**Published:** 2017, Volume 67, Issue 3, Pages 355-360

**Abstract:** This study approaches the matter of whether a dry bloodstain can provide a source for blood-contaminated fingerprints. This question was raised during a murder case, where the defense claimed that wet fingers may have transferred blood from a dry stain onto a clean surface. In order to examine this theory, experiments were conducted at different humidity levels caused by natural and induced sweating as well as by deliberate wetting of the hands. The results indicate that under certain conditions, this type of blood transfer may indeed be possible. However, such an action leaves a distinguishable trace: a "negative-type" fingerprint on the original bloodstain remained each time. This conclusion may greatly assist the investigation in either confirming or rejecting the above hypothesis.

## A Pilot Study to Analyze the Uniqueness of Anterior Teeth Using a Novel Three-dimensional Approach

**Author(s):** Chong, G.T.F.; Forgie, A.H.

**Type:** Article

**Published:** 2017, Volume 67, Issue 3, Pages 361-378

**Abstract:** Anonymized upper and lower dental models of 20 patients who had completed orthodontic treatment with good clinical results were scanned by hand using an intra-oral three-dimensional scanner. The three-dimensional scans were then cropped to include only the incisal 2 mm of the six anterior teeth. The edited images were subsequently imported into the three-dimensional analysis software, and a best fit alignment analysis of test and reference scans was undertaken using approximately 10,000 reference points. The distance between each reference point of both scans was measured, and 0.1 mm was the threshold criteria used to accept as matches.

A pictorial map produced by the software illustrated both quantitative and qualitative data from 420 comparisons undertaken. The software was able to identify matches amongst different software files of the same scan and

different scans of the same models. There was a complete mismatch between the scans of pre- and post-treatment models. There were no perfect matches amongst the different post-treatment three-dimensional scans. However, there were close similarities between four upper and seven lower models using the 0.1 mm threshold. Using stringent criteria, we have shown that the human anterior dentition is unique within this study population. (Read a correction here)

## The Effect of Clothing on the Decomposition of Human Remains

**Author(s):** Capobianco, R.A.; Christensen, A.M.

**Type:** Article

**Published:** 2017, Volume 67, Issue 3, Pages 379-389

**Abstract:** The relation between clothing and the rate of human decomposition is still unclear despite previous research. Some suggest that clothing accelerates decomposition; others indicate that it may slow decomposition. The use of pig models in many of these studies may contribute to this discrepancy. Here we present the results of a pilot study that examined six clothed human cadavers at the University of Tennessee Anthropology Research Facility for a period of one year and compared observations with those documented for unclothed specimens at the same facility using a decomposition scoring approach along with accumulated degree days (ADD). More ADD were required for clothed specimens to reach later decomposition stages, though differences were not highly significant, suggesting that clothing may slow the rate of decomposition, at least in East Tennessee. The amount of clothing worn appears to have an effect.

## Fingerprint Development on Cartridge Cases Through the Electrodeposition of Gun Blue

**Author(s):** Dove, A.

**Type:** Article

**Published:** 2017, Volume 67, Issue 3, Pages 391-409

**Abstract:** This paper examines whether an electrically stimulated deposition of gun blue is a viable technique for developing fingerprints on cartridge cases. By running an electric current through a cartridge case while it is suspended in a diluted solution of gun blue, sebaceous fingerprints were quickly, efficiently, and inexpensively developed to a quality surpassing both the passive deposition of gun blue and the sequential development using cyanoacrylate --> brilliant yellow 40.

## Investigations into the Influence of Donor Traits on the Performance of Fingerprint Development Reagents. Part 1: 1,2-Indanedione-Zinc Chloride

**Author(s):** Fritz, P.; Frick, A.A.; van Bronswijk, W.; Beaudoin, A.; Bleay, S.; Lennard, C.; Lewis, S.W.

**Type:** Article

**Published:** 2017, Volume 67, Issue 3, Pages 410-425

**Abstract:** This study outlines the use of 1,2-indanedione-zinc chloride (Ind-ZnCl<sub>2</sub>) to treat fingermarks with a view to observing possible trends that may be present in a donor population. Fingerprint samples from 131 donors were treated and subsequently evaluated using the grading scale devised by the Home Office Police Scientific Development Branch (now the Centre for Applied Science and Technology; CAST), United Kingdom. Out of a total of 1310 grades assigned, only 6 (0.5%) returned a score of 0, and 64.6% of all grades assigned were a 3 or 4. These tests indicated that grades for fingermarks developed within 3 days vary significantly, depending on the age of the donor and the washing of hands prior to deposition. Donors who did not wash their hands the hour prior to deposition, or were below the age of 25, were more likely to offer higher grades. With fresh fingermarks, no significant variation in fingerprint grades was observed that could be associated with food consumption, sex of the donor, or recent use of cosmetics. The results for the treated 1-month-old fingermarks agreed with the findings for fresh fingermarks, with the exception of washing of hands. In this case, no significant difference was found between graded samples where donors had and had not washed their hands prior to deposition.



## Investigations into the Influence of Donor Traits on Performance of Fingerprint Development Reagents. Part 2: Oil Red O and PD

**Author(s):** Frick, A.A.; Fritz, P.; van Bronswijk, W.; Beaudoin, A.; Bleay, S.; Lennard, C.; Lewis, S.W.

**Type:** Article

**Published:** 2017, Volume 67, Issue 3, Pages 427-446

**Abstract:** Latent fingerprint samples were collected on white copy paper from 148 donors to compare the relative performance of Oil Red O (ORO; propylene glycol formulation) and physical developer (PD; Tween 20 formulation) on both recently deposited samples and those stored for 30 days. PD, when applied following ORO treatment, was found to outperform ORO on both fresh and stored samples, with ORO performance significantly worsening on older samples. Statistical methods revealed that donor age, sex, and recent use of skin products had significant influence on physical developer performance on recently deposited samples. This variation appeared to decrease with increased sample age. Comparisons of the performances of 1,2-indanedione-zinc chloride (Ind-ZnCl<sub>2</sub>) and physical developer showed good complementarity. There was some correlation in that poor Ind-ZnCl<sub>2</sub> performance coincided with poor PD development, suggesting that PD performance is negatively affected by low amounts of eccrine constituents. The lack of other strong correlations between the two reagents reinforce the importance of detection sequences rather than utilizing a single method for fingerprint detection.

## Categorizing Innate Tying Behavior and Knot Sophistication Using Fundamental Principles

**Author(s):** Chisnall, R.C.

**Type:** Article

**Published:** 2017, Volume 67, Issue 3, Pages 447-472

**Abstract:** Tying behavior tends to be consistent, although there are factors that can interfere with the tying process and alter knot chirality. Previous research and case experience indicate that there is a weak correlation between tier handedness and simple knot chirality. These and other insights provide several principles of analysis that allow investigators to profile potential suspects according to their knot-tying habits, giving rise to systems of group-characteristic categorization. Innate tying behavior can be represented using a scale that ranges between the extremes of knot enantiomorph frequencies. As well, knot samples can be characterized according to increasing levels of tying sophistication.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2017, Volume 67, Issue 3, Page 476

**Abstract:** This print appears to have two loops, but only one delta in the pattern area. The loop on the lower left portion on the print is most likely created by an injury. The resulting scar did disrupt the ridges intervening between the core and delta. A ridge count of 14 ridges is still possible. Referencing to other pattern types is not necessary. Thank you to Cpl. Nina Johnson, Victoria RCMP Forensic Identification Section, BC Canada.

## A Procedure for Introducing a Three-Dimensional Crime Scene Scanner into a Crime Scene Workflow

**Author(s):** Pope, L.M.

**Type:** Commentary

**Published:** 2017, Volume 67, Issue 2, Pages 173-175

**Abstract:** Crime scene investigators understand that crime scenes vary from scene to scene. General crime scene investigation techniques and guidelines are offered through many textbooks, publications, and courses; however, each crime scene that an investigator approaches is unique. Aside from following an agency's policies

and procedures regarding crime scene processing, "a generalized outline on how to process a scene can be made to fit a vast number of conditions."

## **A Case of Striking Sibling Similarity and a Scene Impression**

**Author(s):** Eldridge, H.

**Type:** Case Report

**Published:** 2017, Volume 67, Issue 2, Pages 176-179

**Abstract:** In a home burglary case, multiple victim elimination standards were submitted from the same family. One scene impression appeared to share a target group with the left thumb of one family member, but was ultimately identified to the same finger of her sister. This case reminds us that siblings can have similar minutiae configurations and serves as a caution to avoid mindset and always complete a thorough comparison.

## **Copper Brace Method: A New Technique for Reconstructing Broken Bone Fragments**

**Author(s):** Jayaprakash, P.T.; Alarmelmangai, S.; Pushparani, C.; Hadi, H.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 2, Pages 180-189

**Abstract:** Human skulls and other bones recovered in forensic anthropological contexts may be found broken into multiple pieces, requiring reconstruction. This article prescribes a new method, termed copper-brace method, that simultaneously enables retaining the matching pieces of bones and readjusting them during the process of reconstruction, ensuring an acceptable likeness in the spatial and contour configuration of the final reconstruction.

## **Comparing Two Alternate Light Sources with Bluestar Forensic: Locating Blood in a Manipulated Crime Scene**

**Author(s):** Lupica, R.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 2, Pages 190-204

**Abstract:** An experiment was conducted during a training exercise with the goals of locating and photo documenting the presence of blood in a crime scene that had been cleaned up (manipulated). Blood was deposited on walls as transfer stains and as handprints, and the walls were then painted. Bloody footwear prints were deposited on a carpeted floor, and the carpet was then cleaned using an industrial carpet cleaner. The walls and carpet were searched with two alternate light sources (ALS) and Bluestar Forensic to determine whether the presence of blood could be detected. The bloodstains covered by paint were able to be visualized with both of the ALSs and the Bluestar Forensic. The bloodstains on the carpet were made visible only by the use of Bluestar Forensic. Bluestar Forensic provided the best photographic results.

## **Extending Detection Reach with a New Narrow Bandpass Filter**

**Author(s):** Dalrymple, B.; Almog, J.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 2, Pages 206-225

**Abstract:** Fingerprints have been detected and photographed by fluorescence for four decades. The technique has required the use of a barrier filter, in most cases orange, to block the light source reflection and isolate fluorescence. In some cases, however, the substrate also exhibits fluorescence, which can partially or totally obscure the fingerprint. A new narrow bandpass filter, used in combination with the standard barrier filter, can add significantly to both the extent and clarity of inherently and chemically treated fluorescing fingerprints. Moreover, in certain borderline cases, the chemical solution alone may be insufficient, but tailored optics can save the situation by converting an otherwise useless stain to an identifiable impression.



## Potassium Birnessite Deposition on Unfired Cartridge Cases

**Author(s):** Najdoski, M.; Stojkovicj, S.; Oklevski, S.

**Type:** Article

**Published:** 2017, Volume 67, Issue 2, Pages 227-242

**Abstract:** A new cost-effective, simple, and reproducible chemical method for the visualization of latent fingerprints on unfired cartridge cases and also on flat metal surfaces (made of zinc-plated steel, stainless steel, lead, copper, and aluminum) has been designed. This chemical method is based on a deposition of potassium birnessite on the uncontaminated metal surface in the valleys between the fingerprint ridges. The chemical deposition is performed by successive immersion (dip coating) of the cartridge cases into aqueous solutions of manganese(II) chloride and potassium permanganate. The deposited material is examined with x-ray powder diffraction analysis, and the visualization of the fingerprints is characterized on the first, second, and third level with high-resolution photography. This research was carried out on samples of 30 unfired cartridge cases of different calibers and different origins and on 5 different metal surfaces, resulting in the visualization of the latent fingerprints with very good contrast. The designed method is applicable for forensic investigations.

## Developing Latent Fingerprints on Thermal Paper by Fuming with Hydrochloric Acid

**Author(s):** Rairden, A.; Castillo, A.

**Type:** Article

**Published:** 2017, Volume 67, Issue 2, Pages 243-257

**Abstract:** This study examines the development of sebaceous and amino acid latent prints deposited on the emulsion side of thermal paper and attempts to elucidate optimal processing times. Testing results show the ability to develop both amino acid and sebaceous latent print residues; however, the method shows unreliable and inconsistent development of friction ridge detail.

## Quantitative Analysis of the Distortion of Friction Ridge Impressions According to Three Deposition Pressure Levels and Horizontal Movement

**Author(s):** Wallis, J.; Goulet, J.

**Type:** Article

**Published:** 2017, Volume 67, Issue 2, Pages 259-277

**Abstract:** Friction ridge skin is elastic and thus undergoes deformation when subjected to deposition pressure and movement. This study quantified deformation in a fingerprint when performing three and five millimeter, left and right, sliding movements at high, medium, and low deposition pressures. Latent fingerprints were deposited on a glass plate, developed with Chemist Gray powder, and analyzed using Adobe Photoshop. For the analysis, three distinct minutiae were selected in the prints: the core, a minutia to the left of the core, and a minutia to the right of the core. The distances between these three minutia were compared before and after movement as a percent difference to determine the effect of the following variables on deformation: deposition pressure, movement direction, fingerprint pattern (loop, whorl, or arch), distance travelled during deposition, and age of the participant. It was found that most movement conditions decreased the distance between the three points, as compared to the stationary condition, which was shown by a negative percent difference. Also, three millimeter movements resulted in less deformation than five millimeter movements overall. The other variables that were investigated did not have as large of an effect as was anticipated.

## Sources of Skeletal Remains at a Chief Medical Examiner's Office: Who Finds the Bones?

**Author(s):** Pokines, J.T.; Eck, C. J.; Sharpe, M.E.

**Type:** Article

**Published:** 2017, Volume 67, Issue 2, Pages 278-299

**Abstract:** Skeletonized remains are frequently forwarded by law enforcement agencies to medical examiner offices for analysis, but these remains are rarely found initially by law enforcement officers engaged in active searches of suspected remains locations. The present research examined 161 human and 518 nonhuman skeletal cases turned in to the Office of the Chief Medical Examiner, Boston, from all jurisdictions in Massachusetts. The human remains are derived from cases from 1979 to 2016, and the nonhuman cases were all received from mid-November 2011 through mid-November 2016. The most common sources of human skeletal remains were pedestrians, voluntary turnover, and excavation, whereas the most common sources of nonhuman skeletal remains were pedestrians, dogs, and excavation. Data on the time of year that the cases were received were recorded, and human and nonhuman cases showed similar influx patterns (low rates during winter months, a peak in late spring, and generally high levels through the summer before decreasing in fall). These modes of remains discovery do not always correlate with the original depositional environment of the remains, and forensic anthropologists should be aware of the movement of remains that can occur prior to their analysis. The vast majority of bone discoveries in the present research were by accident, so general patterns of human activity may have a larger impact upon the successful finds of the skeletal remains of missing individuals than deliberate searches. The seasonal patterns noted may be used to help plan optimal field case search times in the greater Massachusetts region.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2017, Volume 67, Issue 2, Page 304

**Abstract:** Thank you very much for sharing these interesting prints with us. They are two very nice examples of accidental whorls.

You will notice the interesting ridge detail is below the core and above the baseline (crease). The ridges in this area are being influenced by the deltas and core. This area is the forced area and is one of many orientation clues used when searching latent prints.

## Afro-Cuban Ritual Use of Human Remains: Medicolegal Considerations

**Author(s):** Winburn, A.P.; Martinez, R.; Schoff, S.K.

**Type:** Commentary

**Published:** 2017, Volume 67, Issue 1, Pages 001-030

**Abstract:** Medicolegal professionals occasionally encounter human remains that have been used for ritual purposes. In the state of Florida, practitioners of the Afro-Cuban religious system of Palo (a Kongo-inspired religion frequently referred to as Palo Mayombe) use human skulls and crania in religious rituals [1–3]. Recent research by forensic anthropologists from the University of Florida's C.A. Pound Human Identification Laboratory (CAPHIL) has identified biocultural and taphonomic signatures left by Palo practices on human remains [3]. Some of the traits included in the biocultural and taphonomic signatures are shared by other Afro-Cuban religious systems—most notably, Ocha (often called Santería), Palo's Yoruba-inspired cousin religion [3–6]. However, other traits constitute unique elements of Palo ritual [4, 5], enabling anthropologists to identify the religious affiliation of these assemblages with confidence [3].

We begin this paper with a literature review describing the religious systems of Ocha and Palo, the major components of Afro-Cuban ritual assemblages, and the history of medicolegal interactions with these assemblages. We then enhance existing Afro-Cuban biocultural and taphonomic signatures [3] with new observational data and present a synthesis of material cultural and biological data to enable further specificity in identifying Palo assemblages. Finally, we outline medicolegal considerations for the identification and handling of these ritual assemblages of human remains and material culture. We provide background on the legal and illegal sourcing of ritual human remains, recommendations for criminal investigations, and guidelines for the safe and ethical handling of these unique assemblages—including cases in which they have been contaminated with elemental mercury.

## An Investigation into Whether a Bare Footprint Alters in Length and Width after Jumping from a Fixed Height

**Author(s):** Bailey, R.; Curran, M.J.; Vernon, D.W.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 1, Pages 031-044

**Abstract:** The aim of this study was to evaluate whether there was a difference in the length and width between a standing static bare footprint and a bare footprint measured after jumping from a fixed height. This was undertaken using samples from 23 podiatry students. Initially, a static print was taken for each participant for both left and right feet. A jumping print was created for both left and right feet after each participant had jumped from a measured height of 48 cm. On both occasions, the participant stood on an inkless mat and then jumped onto reactive paper, creating a two-dimensional print. Gunn's method was used to analyze each footprint, and the print was measured to see whether a difference existed between length and width of the two prints. For the left foot and the right foot, the results indicated there was a significant increase in length and width between a standing bare footprint and a footprint taken after jumping. There was a more significant increase in length of the left footprint than the right but more of a significant increase in the width of the right footprint than the left. The conclusion from this research was that there was a statistically significant difference in length and width between a static bare footprint and a footprint taken after jumping from a fixed height.

## A Preliminary Investigation into Background Interferences in Identifying Flammable Residues from Gloves

**Author(s):** Grafit, A.; Avissar, Y.Y.; Kimchi, S.; Muller, D.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 1, Pages 045-059

**Abstract:** Some arsonists use gloves, face masks, socks, and other items to prevent leaving traces like DNA or fingerprints. In some cases, finding gloves with human DNA near a fire scene and with residues of flammable liquids can link the owner to the act of arson. Therefore, it is crucial to differentiate between real flammable liquid residues on the gloves and chemical degradation or manufacturing by-products of the gloves' components.

This paper describes the analyses of some common gloves using solid-phase microextraction (SPME) and gas chromatography-mass spectrometry analysis (GCMS).

The work presented is essentially a preliminary survey of volatile interferents from a wide range of common gloves that may be encountered in cases involving arson. Potential interferents were detected, and it can be hypothesized, although not proven, that the cause of those interferences is in the manufacturing process. It could also be a result deriving from chemical degradation that occurred in the heating process involved before the analyses.

The exact source is yet to be determined, but the main issue is that it is not a flammable liquid added by an arsonist.

## Recovery of Latent Fingermarks from Chalk

**Author(s):** Jasuja, O.P.; Singh, K.

**Type:** Technical Note

**Published:** 2017, Volume 67, Issue 1, Pages 060-069

**Abstract:** In this study, an attempt was made to develop latent fingermarks on blackboard chalk. Black powder, small particle reagent, iodine fuming, silver nitrate, and ninhydrin methods were tried. Latent fingermarks on chalk were successfully developed with all of the methods except ninhydrin. The quality of developed marks was found to be superior with silver nitrate and iodine fuming.

## Methods for Obtaining High-Quality Touch DNA from a Nonporous Surface after Latent Fingerprint Collection

**Author(s):** Hytinen, M.E.; Solomon, A.D.; Miller, M.T.; Cruz, T.D.

**Type:** Article

**Published:** 2017, Volume 67, Issue 1, Pages 071-084

**Abstract:** Fingerprints were initially collected for human identification via ridge pattern analysis; however, successful DNA typing has been generated from fingerprints as well. For nonporous surfaces, fingerprints are typically tape-lifted and transferred to paper backing cards for storage. In this study, to avoid swabbing fingerprints directly for DNA, and thus destroying the ridge pattern, the original surfaces were swabbed for residual touch DNA that may have been left behind after lifting. Despite obtaining null STR profiles, high-quality, quantifiable DNA from the majority of the samples was detected (90 fingerprints tested). A subset of the samples underwent post-amplification purification to attempt to improve STR allele detection; however, no STR allele peaks were detected. In conclusion, viable touch DNA often remains after tape-lifting a fingerprint. Thus, it is highly recommended for crime scene investigators to swab the surface area of latent fingerprints after lifting if DNA typing is desired. These surface swabs, if used in conjunction with other samples taken from the same source, may be enough to improve an otherwise null or nonprobative STR profile to one that is sufficient for human identification. This valuable source of contributor touch DNA should not be overlooked.

## Pseudo-Operational Study on the Efficiency of Various Fingerprint Development Techniques During the Aging Process

**Author(s):** Boudreault, A.; Beaudoin, A.

**Type:** Article

**Published:** 2017, Volume 67, Issue 1, Pages 085-117

**Abstract:** This study aims to discover whether there is a variability in the efficiency of fingerprint development techniques during the aging process of the evidence. Sticky, porous, and nonporous surfaces were sampled and aged for a period from 24 hours to 11 weeks and treated with the appropriate technique. The pseudo-operational study suggests that there is a variability of fingerprint quality obtained depending on the substrate (sticky, porous, or nonporous) and the treatment applied. Some results seem to confirm the degradation hypothesis of fingerprints over a long period of time, especially with 1,2-indanedione-zinc chloride and Oil Red O on white paper. However, the hypothesis was not confirmed with crystal violet (no degradation observed), post-cyanoacrylate staining (rhodamine 6G and brilliant yellow 40), ninhydrin, and physical developer (quality of fingerprints remained stable over time). Hence, we propose that the management of evidence should be improved now that we know that a fingerprint's quality over time appears to vary depending on the substrate and the treatment carried out.

## Black Iron (II/III) Oxide Powder Suspension (2009 CAST Formulation) for Fingerprint Visualization, Part 1: Formulation Component and Shelf-Life Studies

**Author(s):** Downham, R.P.; Ciuksza, T.M.; Desai, H.J.; Sears, V.G.

**Type:** Article

**Published:** 2017, Volume 67, Issue 1, Pages 118-143

**Abstract:** The studies detailed in this paper were concerned with the 2009 Centre for Applied Science and Technology (CAST) black iron (II/III) oxide powder suspension formulation, which is currently recommended for operational use in the United Kingdom for the visualization of fingerprints on nonporous surfaces.

These studies included component comparisons and shelf-life trials and have demonstrated:

The importance of the iron (II/III) oxide product, because not all iron oxide powders on the market with CAS number 1317-61-9 can be used to produce effective powder suspensions.

That the Triton X-100–ethylene glycol surfactant solution (2009 CAST formulation) is effective when used in place of a proprietary Kodak Photo-Flo (cat number 501 0640) based surfactant solution (2006 CAST formulation).

That the Triton X-100–ethylene glycol surfactant solution (stock detergent solution) remains effective after storage for at least two years.

That fully mixed iron (II/III) oxide powder suspension (2009 CAST formulation) showed no appreciable decline in effectiveness after storage for 100 days (approximately).

## **Black Iron (II/III) Oxide Powder Suspension (2009 CAST Formulation) for Fingerprint Visualization, Part 2: Surfactant Solution Component Investigations**

**Author(s):** Downham, R.P.; Ciuksza, T.M.; Desai, H.J.; Sears, V.G.

**Type:** Article

**Published:** 2017, Volume 67, Issue 1, Pages 145-167

**Abstract:** In this second part of our investigations into the importance of various components in the 2009 CAST black iron (II/III) oxide powder suspension formulation, a more detailed examination of the surfactant solution is undertaken. Evidence is presented to demonstrate that:

The concentration of Triton X-100 is required to be above the critical micelle concentration (in the surfactant solution) to prevent the background deposition of iron oxide from powder suspension (on the majority of samples processed).

Ethylene glycol is not a critical component of the formulation.

The Triton X-100–ethylene glycol surfactant solution (2009 CAST formulation) can be diluted down to 10% and 1% without appreciable detriment to the effectiveness of iron oxide powder suspension.

Our ideas for the possible interactions between the iron oxide particles and Triton X-100 surfactant in powder suspension are also presented.

## **Back to Basics**

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2017, Volume 67, Issue 1, Page 172

**Abstract:** The recurve is over a plain arch, so it will not be classified as a whorl, but as a 14 count radial loop. It has many other names such as nutant, nascent, lazy, or nodding loop.

More interesting is it being an index finger, because it is most commonly found in the thumbs.

## **Re: Comparison of the Reagents SPR-W and Acid Yellow 7 for the Visualization of Blood Marks on a Dark Surface J. For. Ident. 2016, 66 (4) 289-302.**

**Author(s):** Bouwmeester, M.; Leegwater, J.; de Puit, M.

**Type:** Correction

**Published:** 2016, Volume 66, Issue 6, Page 497

**Abstract:** On page 291 of the indicated article, the following erroneous statement appeared: "An article noted that the flammable solvents in lumicyano could interfere with DNA analysis [10]." The cited reference does not support that information and in fact indicates the complete opposite. The author and editor apologize for this error and thank Dr. Farrugia (author of the cited information) for bringing this error to our attention.

## **Verification**

**Author(s):** Jennifer Ferraro

**Type:** Commentary

**Published:** 2016, Volume 66, Issue 6, Pages 498-501

**Abstract:** Perhaps one of the most important processes in latent print identification, yet not often talked about, is the verification process. Verification is essentially the act of verifying something and can result in either the same conclusion or a different conclusion. In the latent print community, verification, or the "V" in ACE-V, is the act of another latent print examiner repeating the original latent print examiner's comparison.

The purpose of this commentary is to discuss the different types of verification techniques that are used in the latent print community. Over the years, I have attended several classes that focused mainly on the comparison phase of ACE-V but touched very lightly on the subject of verification. After speaking with several latent print examiners, I realized that there are multiple types of verification techniques that are commonly used in the latent print community. I have often wondered why there is so little focus on something that is a key part of the fingerprint methodology.

## Possible Effects of Insect Repellent on Decomposition

**Author(s):** Fasano, A. D.; Christensen, A. M.

**Type:** Case Report

**Published:** 2016, Volume 66, Issue 6, Pages 502-516

**Abstract:** Given the importance of time since death estimates in medicolegal investigations, it is critical for investigators to understand the myriad factors that may affect the postmortem changes that are often used to arrive at these estimates. Little is known about how decomposition rates are affected when the otherwise normal decomposition process is disrupted by the addition of chemicals. This report addresses the treatment of remains with the insect repellent DEET and its potential effect on decomposition rate as measured using total body score (TBS) and accumulated degree days (ADD). Differences were seen in decomposition rate for two specimens treated with DEET compared to two untreated controls, possibly associated with inhibiting insect colonization. These observations suggest that DEET and other insect repellents may have an effect on decomposition rate and should be considered in time since death estimates in cases where the presence of insect repellent is detected or suspected.

## CCTV Footage used to Link Suspect to Bloody Footwear Impression

**Author(s):** Yuk Ki Cheng

**Type:** Case Report

**Published:** 2016, Volume 66, Issue 6, Pages 517-525

**Abstract:** This case report discusses how CCTV footage was used to link a suspect to a murder scene. Forensic video analysis revealed that the person in the CCTV footage wore a pair of sports shoes with an outsole pattern design that appeared to be the same as that of the bloody footwear impressions at the scene. The results of footwear impression and forensic video examination, and other circumstantial evidence, were sufficient to establish a prima facie case for a court hearing.

## A Protocol for the Recovery of STR DNA from Fingerprints Developed on the Adhesive Side of Duct Tape

**Author(s):** Nouredine, M.; Bailey, J. A.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 6, Pages 527-535

**Abstract:** When adhesive tape becomes an item of physical evidence, the adhesive side can be examined for fingerprint impressions, hairs, fibers, paint, soil, and DNA. The use of a powder suspension method is effective in visualizing and documenting fingerprint impressions on the adhesive side of duct tape. Visible fingerprints, identifiable or not, can then be swabbed for recovering DNA evidence for identification purposes. This project demonstrates that fingerprints deposited on the adhesive side of duct tape can be recovered using nucleic acid-



compatible solvents such as chloroform or heptane. COPAN 4N6 FLOQSwabs facilitated the solubilization of the adhesive and the absorption of the organic solvent containing the DNA sample. This protocol was effective in recovering the donor's full STR DNA profile from fingerprints collected on duct tape over a period of 18 months.

## Analysis of a Vehicle Serial Number Alteration Technique

**Author(s):** Tsach, T.; Finkelstein, N.; Volkov, N.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 6, Pages 536-546

**Abstract:** This paper describes the appearance and effects of a serial number alteration technique. The technique involves thermal treatment of the imprinted area. By locally melting the metal, a liquid metal pool is created in the imprint area that alters the metal's "memory". Existing chemical approaches (e.g., Fry's reagent) to number restoration was ineffective in restoring numbers altered or obliterated by this technique.

## Experimental Wood Chipper Trauma on Bone

**Author(s):** Domenick, K.; Christensen, A. M.

**Type:** Article

**Published:** 2016, Volume 66, Issue 6, Pages 547-559

**Abstract:** Wood chippers have been portrayed as a quick and effective method of disposing of a body, destroying features that could lead to identification, and aiding the perpetrator in avoiding detection. Wood chippers are also easily accessible at relatively little cost and have been used in actual cases of human dismemberment. Most of what is known about wood chipper trauma is based on popular media portrayals, a small handful of documented cases, and very few scientific studies. The following study attempts to better understand wood chipper trauma on the skeleton through an experiment in which five domestic pig (*Sus scrofa*) limbs were inserted into a home model wood chipper. Results suggest that wood chippers create a pattern of skeletal trauma that can be identified and associated with wood chippers in a forensic context. This pattern includes the production of bone fragments with the majority measuring approximately 3–6 mm, two-sided complete cuts creating roughly parallel-sided fragments, and other alterations that may be related to the type of wood chipper used. Combined with the failure to significantly reduce soft tissues and retention of material within the machine, results indicate that, contrary to popular belief, wood chippers are not an effective means of disposing of remains, and the recovery and identification of remains dismembered using a wood chipper is still possible.

## New Lumicyano Kit: Comparison Studies with the First Generation and Effectiveness on Nonporous Substrates

**Author(s):** Bisotti, A.; Allain, C.; Georges, J.; Guichard, F.; Audebert, P.; Barbosa, I.; Galmiche, L.

**Type:** Article

**Published:** 2016, Volume 66, Issue 6, Pages 560-575

**Abstract:** Lumicyano is a fluorescent cyanoacrylate that allows a one-step development of latent fingerprints without changing the fuming chamber settings. To improve the fluorescence intensity of the fingerprint revealed with Lumicyano as well as the stability of its fluorescence over time, the manufacturer of Lumicyano has developed a modified version (Lumicyano Kit), separating the cyanoacrylate (Lumicyano Solution) and the fluorophore (Lumicyano Powder). This study compares the first version of Lumicyano with Lumicyano Kit using a 1% and 4% Lumicyano Powder on nonporous substrates. This study demonstrates that on all of the substrates investigated (glass, aluminum foil, white and black plastic) on fresh or aged (one week, three weeks) fingerprints, the use of Lumicyano Kit improves the quality of the development.

## Recovery of Latent Prints from Nonporous Objects Exposed to Snow

**Author(s):** McCook, S. J.; Tate, D. P.; Eller, J. B.

**Type:** Article

**Published:** 2016, Volume 66, Issue 6, Pages 577-590

**Abstract:** This study investigated the effects that weather, particularly snow, could have on the recoverability of latent fingerprints from nonporous items. For all 167 impressions in this study, physical and chemical processing allowed for the development of some amount of ridge detail. These observations suggest that it may indeed be worthwhile for an agency to attempt the recovery of latent prints from evidence that was exposed to snow.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2016, Volume 66, Issue 6, Page 596

**Abstract:** The first question to ask is whether the ridge structure below the distal joint is a wart or a scar. Warts will push ridges out; they do not form deltas. The delta to the right of the right structure was formed before birth by the meeting of different ridge fields. The scar may be from the removal of an extra finger. Without knowing for sure, this is speculation.

With that being said, the structure is outside the pattern area. The pattern type is a nine count loop with no references.

## Casting Bloodstain Patterns: AccuTrans versus Mikrosil

**Author(s):** Kowalske, Z.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 5, Pages 381-387

**Abstract:** The use of casting agents is common for molding impressions of tool marks and latent prints on uneven surfaces. This study compares two casting products (AccuTrans and Mikrosil) and their ability to cast bloodstain pattern impressions. The results indicate that AccuTrans provided more detail.

## Cyanoacrylate Processing of Tape Following the Use of Un-Du

**Author(s):** Matthias, G.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 5, Pages 388-394

**Abstract:** The procedure of processing both the nonadhesive and adhesive sides of tapes following the application of un-du is tested. Also, the application of excessive amounts of un-du on both the tape and the surface the tape was affixed to is tested. Results indicate that the application of the un-du liquid does not have a negative effect when processed using the cyanoacrylate fuming method or in excessive amounts.

## Using Dry Fire Extinguisher to Develop Latent Fingerprints and its Comparison with Other Methods of Fingerprint Development

**Author(s):** Boateng, J.; Jasra, P.; Cowper, D.; Jasra, S.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 5, Pages 395-404

**Abstract:** The effectiveness of dry fire extinguisher powder to develop latent fingerprints on glass, tile, and metal was investigated in this study. This method was then compared with four other fingerprint development methods: cyanoacrylate -> rhodamine, fluorescent powder, granular powder (white or black), and magnetic powder. The results showed that the development of fingerprints with fire extinguisher powder was comparable to other methods on both heated and unheated surfaces.

## Communication of Statistically Based Conclusions to Jurors - A Pilot Study

**Author(s):** Bayer, D.; Neumann, C.; Ranadive, A.

**Type:** Article

**Published:** 2016, Volume 66, Issue 5, Pages 405-427

**Abstract:** During the 20th century, scientists in most forensic sub-disciplines reported categorical opinions on the source of material recovered in connection with a crime. Following the development of DNA evidence, legal and scientific scholars have urged these scientists to determine the probative value of forensic evidence in a more transparent way and to present conclusions in a fair and balanced fashion. Unfortunately, statistical information is not well understood or used rationally by most individuals when reasoning. Most jury studies have focused on jurors' understanding of reporting techniques currently used by the profession; very few studies have attempted to develop novel reporting techniques based on cognitive-psychological findings on efficient communication. This study explores some possible reporting techniques and describes some of the main challenges of the development and testing of novel conclusion presentation methods. Some of our main findings are similar to other jury studies. Study participants did not entirely account for the forensic evidence when updating their belief that the considered source was in fact the true source of the trace, however, participants provided with likelihood ratios showed less variability in their answers compared to participants provided with categorical conclusions. In addition, we observed a systemic bias against the defendant prior to hearing the forensic evidence. Finally, we found that recording participants' beliefs involved solving a circular conundrum: measuring the variability in the participants' understanding of quantitative information requires the use of quantitative scales that they may not all perceive in the same way.

## A Comparison of Conventional Microspectrophotometry and Hyperspectral Imaging for the Analysis of Blue Metallic Paint Samples

**Author(s):** Pei Lin, I.; Hemmings, J.; Otieno-Alego, V.; Blee, A.; Robertson, J.; Lennard, C.

**Type:** Article

**Published:** 2016, Volume 66, Issue 5, Pages 429-453

**Abstract:** Paint is often encountered as forensic evidence, particularly in cases involving vehicle accidents or property damage. In a forensic context, visual examination and color analysis of paint samples are methods employed early in the analytical sequence. Conventional visible microspectrophotometry, a technique dating back to the 1980s, is a well-documented analytical technique for forensic analysis. Hyperspectral imaging, on the other hand, is a relatively new technique with many potential forensic applications yet to be fully explored.

In this pilot study, hyperspectral imaging using the Prism and Reflector Imaging Spectroscopy System (PARISS) and associated software was applied to a range of metallic blue vehicle paint samples, and the results were compared with those obtained using conventional microspectrophotometry. The results suggest that hyperspectral imaging offers significant advantages, particularly for heterogeneous samples such as metallic paint where conventional microspectrophotometry is problematic. The PARISS generated high-quality spectra and a high level of discrimination, with additional advantages that included individualized spectral libraries, result histograms and false-color images showing the distribution of spectral types across a sample. Although only a preliminary investigation has been conducted on a limited set of blue metallic samples (flat and relatively large in size), the superior discriminating power combined with the rapid generation of spectra across the field of view suggests that hyperspectral imaging using the PARISS may be an efficient and effective alternative to traditional microspectrophotometry for the analysis of vehicle paints. The results justify further research to explore the application of hyperspectral imaging as an alternative to conventional microspectrophotometry.

## Age Estimation Through the Study of Dental Crowns: Digital Application of Shiro Ito's Method

**Author(s):** De Trane, C.; Loty, C.; Loty, S.; Ducrettet, F.; Schuliar, Y.

**Type:** Article

**Published:** 2016, Volume 66, Issue 5, Pages 455-475

**Abstract:** This study evaluated a method for age determination that was based on Shiro Ito's method of using thin cut analysis of permanent dental crowns.

Digital radiographic and photographic images of anterior teeth and posterior teeth were analyzed. Two equations, using multiple linear regression, were calculated and validated. The coronal surfaces of enamel, dentin, and pulp were measured in pixels on these images and incorporated into these equations for age estimation.

The most accurate estimations were observed in the maxilla with canines (MAE = 4.5 years,  $r = 0.80$ ) and in the mandible with lateral incisors (MAE = 6.2 years,  $r = 0.77$ ).

## Population Frequencies of Skeletal Traits That May Be Used in Radiologic Identification: A Review of the Keats' Atlas

**Author(s):** Abdalla Ford, J.; Christensen, A.

**Type:** Article

**Published:** 2016, Volume 66, Issue 5, Pages 477-492

**Abstract:** Skeletal traits as observed using various radiologic imaging modalities (such as X-ray and CT) are commonly used in forensic identification comparisons. Such comparisons have traditionally been made using relatively subjective visual approaches, relying on the experience and ability of the examiner. In order to bolster the results of radiologic comparisons with objective, statistically based approaches, more data are needed on the frequencies of these skeletal traits in the relevant population. Population frequencies describe how rare or common a feature is, and form the basis for the validity of any identification approach. The population frequencies of many traits used in forensic radiologic comparisons, however, are not known in many cases or are difficult to access in others. Here we present a review of traits and sources found in Keats and Anderson's Atlas of Normal Roentgen Variants That May Simulate Disease in an effort to document and compile some of the currently available frequency data for a variety of skeletal traits.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2016, Volume 66, Issue 5, Page 496

**Abstract:** This impression required input and consultation from other examiners. This is what was decided.

There is a sufficient recurve between the two deltas, but no ridges are present that make a complete circuit. There are ridges that run out the top of the print. The two pattern types make it an accidental whorl. If the ridges in front of the right delta were spoiled then you would only have the ridges running out the top.

So the initial classification is an accidental whorl with a reference to a tented arch of the cuspal type.

## Transfer DNA on Laboratory Gloves: A Potential Complicating Factor in the Interpretation of Forensic DNA Typing Results

**Author(s):** Vogelsberg, C.C.M.; Latham, K.E.; Cale, C.M.; Bush, G.L.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 4, Pages 277-287

**Abstract:** Minimizing contamination in a forensic DNA laboratory is imperative for accurate results of the highest possible quality. Such measures as implementing strict personal protective equipment protocols in the form of laboratory gloves can decrease rates of contamination and assure the reliability of results being produced. This study investigated the possibility of contaminating unused laboratory gloves throughout prolonged box use in a variety of laboratory settings. The study was conducted in two stages, one to assess whether removal of gloves from both new and previously opened glove boxes by gloved or ungloved researchers affected subsequent glove contamination ( $n = 15$ ) and another to assess general levels of contamination on open glove boxes found in

active academic and research laboratories (n = 30). Samples from both stages of the study were amplified using the AmpFISTR Identifiler Plus PCR Amplification Kit. In the first phase, only one sample originating from a previously opened box of gloves yielded results at three loci when visualized at 100 RPU. In the second phase, three samples obtained from boxes in academic laboratories yielded DNA, however, none were quantified from samples obtained from laboratories with strict contamination precaution procedures in place. The results of this study indicate that, although contamination of laboratory gloves is possible through regular glove obtainment, current procedures in laboratories with restricted access and contamination precautions may be sufficient to reduce this potential source of error.

## Comparison of the Reagents SPR-W and Acid Yellow 7 for the Visualization of Blood Marks on a Dark Surface

**Author(s):** Bouwmeester, M.; Leegwater, J.; de Puit, M.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 4, Pages 289-302

**Abstract:** This article is a follow-up of the study "A Comparison of Reagents for the Visualization of Blood Prints on Knives with Black Handles" (Journal of Forensic Identification, 2011, 61 (4), 353–362), which ended with recommendations for further research. This further research was carried out and the results are described here.

In this study, the results for sequential processing of cyanoacrylate or lumicyano with the reagents SPR-W (small particle reagent white) and acid yellow 7 (also known as brilliant sulphof lavine) on blood marks can be found. Furthermore, the DNA recovery rate was measured after these sequential techniques. Treating fingermarks in blood with SPR-W gave the best results, in terms of visibility of the marks, when no pretreatment with cyanoacrylate was carried out. DNA recovery was successful only for the first blood fingermark of the depletion series, for almost all applied treatments. The different treatment methods do not seem to be of influence on the DNA recovery.

Read a correction to this Technical Note [here](#).

## Determining Whether Aluminum is a Cyanoacrylate Polymerization Retardant

**Author(s):** Pires, C.; Springer, E.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 4, Pages 303-308

**Abstract:** In the past, several publications regarding cyanoacrylate fuming indicated that the use of an aluminum container will retard the polymerization of cyanoacrylate prior to vaporization and therefore recommended that an aluminum dish should be used during fuming to maximize unpolymerized cyanoacrylate fumes. This study was designed to determine whether aluminum retards polymerization when compared to other substrates. Results suggest that aluminum does not retard polymerization when compared to glass, steel, and ceramic.

## The Use of a Liquid Bandage to Prevent the Deposition of Friction Ridge Detail Impressions

**Author(s):** Perkins, D.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 4, Pages 309-315

**Abstract:** Impressions were left by an area of friction ridge skin that was covered in one or more layers of a liquid bandage. Some impressions were deposited directly onto a surface. Others were deposited only after the area of skin had contacted an additional surface likely to have transferable residue on it. A single layer of the product prevented identifiable impressions being left when they were deposited directly onto a surface; many layers were required to prevent identifiable impressions being left in residue transferred from another surface.

## Development Techniques on Porous Surfaces

**Author(s):** Mostowtt, T.; Ramotowski, R.S.; Morgan Jr., J.P.

**Type:** Article

**Published:** 2016, Volume 66, Issue 4, Pages 326-348

**Abstract:** Although heat has been used to develop latent prints in the past, recently published material has renewed interest in this visualization method. The Thermal Fingerprint Developer 2 (TFD-2), an automated device that uses heat to produce fluorescent prints on porous surfaces, was recently introduced to the forensic marketplace. An evaluation of this new thermal method was conducted in three phases. In Phase I, the optimal conditions (scan speed, power setting, and number of scans) for the TFD-2 instrument were determined. In Phase II, a direct comparison using split-depletion prints was conducted between the TFD-2 and several common operational visualization techniques for porous surfaces (1,2-indanedione-zinc, ninhydrin, and PD). In Phase III, the impact of incorporating the TFD-2 in standard latent print processing sequences was evaluated. Overall, Phase II results indicated that conventional chemical processes outperformed the TFD-2. Phase III results indicated that using the TFD-2 first in a processing sequence could adversely affect the success of subsequent treatments.

## The Taphonomic Effects of Eastern Gray Squirrels (*Sciurus carolinensis*) Gnawing on Bone

**Author(s):** Pokines, J.T.; Santana, S.A.; Hellar, J.D.; Bian, P.; Downs, A.; Wells, N.; Price, M.D.

**Type:** Article

**Published:** 2016, Volume 66, Issue 4, Pages 349-375

**Abstract:** The eastern gray squirrel (*Sciurus carolinensis*) is known to gnaw on bone and thus has the potential to affect terrestrial surface remains in forensic scenes throughout its extensive geographic range in North America and other places in the world where it has been introduced. To determine the timing, extent, and characteristics of gnawing of this rodent species within an urban environment, an initial sample of 305 dry postcranial bones of white-tailed deer (*Odocoileus virginianus*) were wired to trees for a period of 8 weeks and observed every 2 weeks in multiple sites in Boston, Massachusetts. Squirrel gnawing damage included the typical parallel striations noted for rodents and the loss of epiphyses of long bones, marrow cavity exposure, and sculpting of bone margins, with a cumulative total of 58 out of the original sample of 305 bones (19.0%) having gnawing damage of some kind. When subtracting the bones lost during the experiment without previous gnawing, the cumulative total is 58 out of 271 bones (21.4%). Rodent gnawing can advance rapidly, potentially causing the loss of diagnostic bone features and obscuring previous trauma sites, and researchers should be aware of its effects on exposed skeletal remains.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2016, Volume 66, Issue 4, Page 380

**Abstract:** This print is a nine count loop. The lower delta is below the distal crease and outside the pattern area. Therefore, it doesn't require any other reference. It does make an interesting pattern.

## A Case of Localized Corrosion on Bone Caused by Chemical Contact

**Author(s):** Pokines, J. T.; Springer, K.



**Type:** Case Report

**Published:** 2016, Volume 66, Issue 3, Pages 173-186

**Abstract:** A case of heavy but highly localized corrosion of bone caused by chemicals mixed to form hydrogen sulfide is presented. This case comes from eastern Massachusetts and was recovered and analyzed by personnel from the Office of the Chief Medical Examiner in Boston. Multiple bottles of commercial cleaning products, some of which were open, were recovered with skeletonized remains that had decomposed outdoors inside a tent. The corrosive chemicals pooled in water around the remains on top of a waterproof tent bottom, causing corrosion that was most pronounced on the right foot, with almost complete loss of phalanges and severe damage to other elements despite being protected inside footwear. This taphonomic alteration has the potential to be mistaken for animal gnawing, coffin wear, or perimortem trauma and could be formed under similar circumstances in different environments.

## Fingerprints: Beyond the Source

**Author(s):** Girelli, C. M. A.

**Type:** Case Report

**Published:** 2016, Volume 66, Issue 3, Pages 187-195

**Abstract:** This work presents a case study in which the experts were able to conclude that fingerprints that were present in different identity documents not only came from the same source, but were copies of the same image. An experiment with fingerprints deposited under controlled conditions was used to explain how minutiae and extrinsic factors can help experts to detect forgeries in documents.

## Cobalt Chloride Hexahydrate as an Enhancement Reagent for Two-Dimensional Footwear Impressions Containing Ice-Melt Product Residue

**Author(s):** Karakkat, K.; Schwartz, T.; Quarino, L.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 3, Pages 196-207

**Abstract:** Cobalt is a transition metal that is suitable to form coordination complexes with Lewis bases and is most commonly found as cobalt chloride hexahydrate. Given that ice-melt products typically contain moieties with free electron pairs (and thus can serve as a Lewis base), such as chloride salts or urea, the potential use of cobalt chloride hexahydrate as an enhancement reagent for footwear prints containing ice-melt products was investigated. Footwear impressions were made on nine different substrates from aqueous solutions of seven commercial ice-melt products of different compositions. To dried footwear impressions, an aqueous 20% (weight/volume) cobalt chloride hexahydrate solution was sprayed evenly. In most cases, a heated blow dryer was then applied over the imprint to turn the color of the enhancement from a lighter pink (the color of cobalt chloride hexahydrate) to the darker blue-purple (the color of anhydrous cobalt chloride), which typically yielded better contrast. Enhancements were obtained with all product compositions except one product containing calcium magnesium acetate. In general, diatomic chloride salts yielded better enhancements than those made from products containing monoatomic chloride salts. Products containing urea or proprietary formulations containing amides also produced good enhancements. The quality of the enhancement was likely affected by the porosity and texture of the substrate as well as the low viscosity of water.

## Forensic Management of Artifacts in Human Identification: The Experience of the Committee on Missing Persons in Cyprus

**Author(s):** Myossi, N.; Ktori, M.; Vehit, U.

**Type:** Article

**Published:** 2016, Volume 66, Issue 3, Pages 209-231

**Abstract:** The Committee on Missing Persons in Cyprus (CMP) is a bicomunal body established in 1981 that aims to recover, identify, and return remains to the families of 2001 missing persons from events that occurred

between 1963 and 1964 and in 1974. At the time of the writing of this article, the remains of 1061 individuals have been exhumed, and 625 have been identified.

This article presents a system for forensic management and artifact collection during the identification of missing persons, the usefulness of the information that is provided by artifacts, and the impact that artifacts have on families when artifacts are released to the families with the remains. The CMP experience indicates that proper forensic management plays an important role in the identification process and contributes to bicomunal stability in Cyprus.

## **Determining the Effects of Surface, Age, and Depletion on Latent Prints Processed with Aerosolized Powder Puff Fingerprint Powder**

**Author(s):** Moore-Davies, S.; Christophe, D. P.; Morris, T. L.

**Type:** Article

**Published:** 2016, Volume 66, Issue 3, Pages 233-243

**Abstract:** In this study, fingerprints were processed on five different substrates with the aerosolized powder, Powder Puff (Lynn Peavey Company). The prints were deposited on each surface and stored where they would be undisturbed for three different periods of time (0 days, 5 days, 10 days) before being processed. Each age contained a depletion series of three successive prints. The prints were then individually photographed and the photographs were used to create survey packets containing 15 prints each. These surveys were distributed to 55 students at the University of Central Oklahoma's W. Roger Webb Forensic Science Institute. Students were asked to evaluate each print on a scale from 0 to 4 based on the level of detail they could see. A significant interaction was found between the three variables: surface, age, and depletion series. The mean ratings did not consistently increase or decrease with age or depletion. Overall, tile had a tendency to have the highest mean rating whereas painted wood had the lowest.

## **A Limited Validation and Comparison of 1,2-Indanedione and Thermanin for Latent Print Development on Thermal Paper**

**Author(s):** Ponschke, M.; Hornickel, M.

**Type:** Article

**Published:** 2016, Volume 66, Issue 3, Pages 245-258

**Abstract:** As part of a validation study conducted for the Illinois State Police, two processing techniques (1,2-indanedione and Thermanin) for visualizing latent prints on thermal paper underwent performance checks prior to their inclusion in the Illinois State Police Latent Prints Procedures Manual. Five participants deposited fingerprints on six types of thermal papers, which were then cut in half lengthwise. Each half was then processed by one of the two techniques. The ages of the sample latent prints were varied as well as the processing times. Preserved latent print detail was evaluated by 10 experienced latent print examiners, who judged the samples for the presence or absence of latent print detail and the quality of any detail produced. In addition, the examiners judged whether prints were suitable for comparison and were asked which processing method was preferred. Both 1,2-indanedione and Thermanin were productive on sample latent prints, with ridge detail developed on 99.2% and 95% of the samples, respectively. Additional examination of samples meant to imitate casework also showed success.

## **Using a 3D Laser Scanner to Determine the Area of Origin of an Impact Pattern**

**Author(s):** Dubyk, M.; Liscio, E.

**Type:** Article

**Published:** 2016, Volume 66, Issue 3, Pages 259-272

**Abstract:** The ability of a bloodstain pattern analyst (BPA) to analyze bloodstains at a bloodletting crime scene to determine the area of origin (AO) of an impact pattern is dependent upon the collected data. The collection of data can be labor intensive and time consuming. This experiment demonstrated that three-dimensional (3D) laser scanners can greatly assist the BPA with scene examination, provide accurate AO determinations, and

decrease time at the crime scene. In this experiment, the accuracy and processing time of the FARO X330 3D laser scanner with FARO SCENE software was compared to traditional manual methods of collecting the data and then downloading the data to the HemoSpat program for analysis. Three typical impact patterns were created for this experiment. There was an acceptable range of accuracy between the results produced by HemoSpat and those produced by FARO. The time to document patterns with HemoSpat ranged from 42 to 59 minutes; FARO documentation times ranged from 15 to 21 minutes. The time to analyze the patterns with HemoSpat ranged from 49 to 69 minutes; FARO consistently took 45 minutes.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2016, Volume 66, Issue 3, Page 276

**Abstract:** The first impression may be to classify this print as a cuspal tented arch. However, the ridges do not flow out the top of the print, so it would be classified as a plain arch first and then referenced to a tented arch.

## Letter to the Editor re: Critical Incident Trauma and Crime Scene Investigation: A Review of Police Organizational Challenges and Interventions

**Author(s):** Laskowski, G. E.

**Type:** Letters

**Published:** 2016, Volume 66, Issue 2, Pages 081-082

**Abstract:** See Critical Incident Trauma and Crime Scene Investigation: A Review of Police Organizational Challenges and Interventions in JFI 65 (6), 2015

## Naturally Occurring Minutiae

**Author(s):** Rivera, J. H.

**Type:** Commentary

**Published:** 2016, Volume 66, Issue 2, Pages 083-091

**Abstract:** The field of forensic science has considered fingerprints as the primary representation of ridge patterns and individualized minutiae characteristics. Consideration should also be given to other scientific fields where specimens exhibit similar characteristics. In the studies of botany, entomology, zoology (wildlife forensics), marine biology, and geology, evidence warrants further investigation into the value of examining minutiae characteristics within these scientific fields. There are a variety of animals and botanical specimens, in addition to geological landscapes, that mirror fingerprint minutiae detail and could contribute to a forensic investigation.

## The Use of a Dry Chemical Fire Extinguisher for the Development of Latent Fingerprints in Marijuana Grow Operations

**Author(s):** Piekny, J.; Knaap, W.

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 2, Pages 092-105

**Abstract:** The purpose of this study was to verify the theory of using a dry chemical (powder) fire extinguisher for developing fresh latent fingerprints from different surfaces commonly found within clandestine marijuana grow labs. Fingerprints (n = 96) were deposited on various substrates. The room was fogged with an ABC-type dry chemical fire xtinguisher, directing the chemical discharge at the surfaces bearing the fresh latent impressions. Sixty-five fingerprints were developed (51 of which could be useful for comparison purposes) in a matter of seconds. This study shows the potential for the use of a dry chemical fire extinguisher to develop high-quality, detailed fingerprints from marijuana grow lab operations in a timely and efficient manner.

## Is Diurnal Variation a Factor in Bare Footprint Formation?

**Author(s):** Burrow, J. G.

**Type:** Article

**Published:** 2016, Volume 66, Issue 2, Pages 107-117

**Abstract:** This limited study considered whether the collection of the exemplar footprints, and the resultant analysis and comparison, could be influenced by the time of day that the exemplar footprints were collected compared to a possible time when the footprints were first made.

Dynamic footprints were collected from individuals on two occasions during the day (four footprints in total for each individual) using a test/re-test design. The Reel method of analysis determined measurements and allowed comparisons between the four sets.

A two-way repeated measures ANOVA analysis suggested that diurnal variation was probably not an issue and that exemplar footprints did not show deviations that were due to the time of day when the footprints were collected. This might further suggest that, in this respect, work undertaken on past cases is reliable, and time of day is not a variable that needs consideration and accounting for when working future bare footprint cases. However, caution may be needed where environmental and temperature variables need consideration.

## Oil Red O: A Comparative Performance Study

**Author(s):** Honig, M.; Yoak, J.

**Type:** Article

**Published:** 2016, Volume 66, Issue 2, Pages 118-133

**Abstract:** Recently, Oil Red O (ORO) has been used to stain the fatty or lipid portions of latent print residue on porous items and porous items that have been wet. Currently for porous items, the Virginia Department of Forensic Science uses ninhydrin and physical developer (PD). Ninhydrin is a chemical that reacts with water-soluble amino acids and therefore cannot be used on items that have been wet. PD reacts with the lipid components of latent print residue and is used to process porous items that have been wet. PD generally produces good results, but it is a complex and tedious method. A study was conducted at the Virginia Department of Forensic Science to test the use of ORO in casework as an effective process for developing latent prints on porous items that have been wet. This study illustrates that ORO is efficient as an option for processing porous items that have been wet.

## Latent Fingerprints on a Nonporous Surface Exposed to Everyday Liquids

**Author(s):** Maslanka, D. S.

**Type:** Article

**Published:** 2016, Volume 66, Issue 2, Pages 137-154

**Abstract:** This article investigates how common household liquids (milk, wine, soft drinks, beer, orange juice, and soapy water) may affect a latent fingerprint on a nonporous surface after different amounts of time have passed: 1, 12, and 24 hours. After each interval, the latent fingerprints were processed with either ferromagnetic powder or small particle reagent. All of the latent fingerprints that were exposed to milk, wine, soft drinks, beer, and orange juice after each time interval when averaged, despite the method of processing, were rated as reasonable to excellent quality (except wine at the 24-hour interval when processed with SPR). The latent fingerprints submerged in soapy water displayed a significant decrease in quality after 12 hours; by 24 hours, they were not visible or very few ridges were visible.

## Characterization of Printing Characteristics of Color-Photocopied and Laser-Printed Documents

**Author(s):** Saini, K.; Saroa, J. S.

**Type:** Article

**Published:** 2016, Volume 66, Issue 2, Pages 155-170

**Abstract:** The purpose of this study was to analyze printed documents to determine whether they could be identified to the printers that produced them. Twenty-eight processed color samples were examined for toner deposit patterns and counterfeit protection system (CPS) codes. Twenty-five of the 28 samples were identified on the basis of CPS codes; all 28 samples were differentiated from each other on the basis of toner deposit patterns. Therefore, it is concluded that toner deposit patterns and counterfeit protection system codes can be used as complementary to each other in routine forensic document examination.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2016, Volume 66, Issue 2, Page 172

**Abstract:** Things to consider:

The delta and its placement

The lower type line

The line of flow

The obstruction at right angle rule

Questions to ask:

Where is the appendage attached to the only recurving ridge?

Are the inner ridges at a right angle to the line of flow?

Is the delta the short ridge or the attached ridge?

Is the lower type line the attached ridge?

The attached ridge does not diverge, so it will not be considered as the lower type line; the ridge below it will be. The inner ridges do not obstruct at a right angle to the line of flow. While very close, the short ridge will be the delta because the top end is nearest to the point of divergence. The attached ridge is not in the line of flow.

## Letter to the Editor re: Ghosting of Images in Barefoot Exemplar Prints Collection: Issues for Analyses in JFI 65 (5), 2015

**Author(s):** Reel, Dr. Sarah M.

**Type:** Letters

**Published:** 2016, Volume 66, Issue 1, Page 001

**Abstract:** See Ghosting of Images in Barefoot Exemplar Prints Collection: Issues for Analyses in JFI 65 (5),2015.

## Understanding Digital Enhancement Processes

**Author(s):** Loll, Allison

**Type:** Technical Note

**Published:** 2016, Volume 66, Issue 1, Pages 003-012

**Abstract:** Digital imaging processes have become widely used in the latent print community. Adobe Photoshop and other imaging programs (e.g., those provided by Mideo Systems Inc.) have built-in enhancement tools that examiners can apply to images. However, information about how these tools work can be elusive because of the

developers' proprietary rights. This paper addresses which of the more common enhancement tools alter the data in the image and which ones do not.

## Using Alginate Gel Followed by Chemical Enhancement to Recover Blood-Contaminated Fingermarks from Fabrics

**Author(s):** Bentolila, A.; Reuveny, S.A.; Attias, D.; Elad, M.L.

**Type:** Article

**Published:** 2016, Volume 66, Issue 1, Pages 013-021

**Abstract:** Blood-contaminated fingermarks were placed on different types of fabrics to determine whether alginate gels could be used to lift the fingermarks from the fabric. The lifted gels were processed with amido black to optimize the fingermark detail. The results on the gels were compared to fingermarks processed directly on the fabrics with amido black after the lifting procedure. This gel-lifting technique shows a real advantage in the detection of blood-contaminated fingermarks on dark-patterned synthetic silk.

## Evaluating Imaging Techniques for Intraoral Forensic Radiography with the Dental Hygienist as Part of the Forensic Radiology Team

**Author(s):** Bruhn, A.M.; Newcomb, T.L.; Giles, B.

**Type:** Article

**Published:** 2016, Volume 66, Issue 1, Pages 022-036

**Abstract:** Intraoral forensic radiographic images are highly informative for comparative dental identification, postmortem profiling, and age estimations. However, empirical research is needed to determine optimal imaging techniques for postmortem radiographs in dental forensic radiography with the dental hygienist as part of the forensic radiology team. The aim of this study was to provide a clear protocol for forensic dental radiographic imaging that considered both safety and optimal imaging techniques. The study was conducted on simulated human remains using both the paralleling and bisecting techniques in which participants (N = 38) took 10 intraoral dental x-ray exposures. The paralleling technique tended to produce superior images in forensic dental radiography, proving the usefulness of positioning devices when exposing PM images with the paralleling technique ( $p < 0.001$ ). However, in practice, the bisecting technique may be necessary because of equipment availability and the antemortem technique used. A protocol that combines considerations of technique and safety with the dental hygienist as the radiographer is presented.

## A Comparison of Photography and Casting Methods of Footwear Impressions in Different Sandy Soil Substrates

**Author(s):** Snyder, Christine

**Type:** Article

**Published:** 2016, Volume 66, Issue 1, Pages 037-058

**Abstract:** Seven different sandy soils were utilized to create three-dimensional footwear impressions from two left athletic shoes (Saucony and New Balance). The two shoes had been previously worn and then additional randomly acquired characteristics of various shapes and sizes were added to the outsoles. The footwear impressions were photographed (using examination-quality photographic techniques) and cast with dental stone. The resulting photographs and casts were compared to the shoes, and the randomly acquired characteristics present were noted. The casts retained more randomly acquired characteristics than did the photographs in the footwear impressions in all of the sandy soils and from both shoes. This research concluded that casts should be collected whenever possible in addition to examination-quality photographs to provide the footwear examiner with the best evidence possible.



## Taphonomic Alterations to Terrestrial Surface-Deposited Human Osseous Remains in a New England Environment

**Author(s):** Pokines, James T.

**Type:** Article

**Published:** 2016, Volume 66, Issue 1, Pages 059-078

**Abstract:** The present research examines human bone cases (n = 22) that were recovered from outdoor terrestrial environments in Massachusetts and submitted for analysis to the Office of the Chief Medical Examiner, Boston. All macroscopic taphonomic changes resulting from the physical and biological effects of terrestrial exposure to the bones were compiled. These traits were compared to white-tailed deer (*Odocoileus virginianus*) bone cases (n = 26) that were recovered from the same environment. Multiple characteristics are indicators of terrestrial exposure, including a differential pattern of taphonomic alterations reflecting contact and noncontact with the soil surface, subaerial weathering, irregular soil staining, and carnivore and rodent gnawing. These may be used in conjunction with other taphonomic data to distinguish a terrestrial environment as the origin of unknown osseous remains from other common forensic sources, including marine, buried, or cemetery remains.

## Back to the Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2016, Volume 66, Issue 1, Page 080

**Abstract:** This print is being presented because of the loop at the extreme tip of the finger. The loop has no bearing on the classification, therefore the pattern type is a whorl with no references. Without the deltas, the tracing cannot be accurately determined.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2015, Volume 65, Issue 6, Page 1018

**Abstract:** First impression might be that this is a "cuspal" tented arch. However, the ridges do not flow out the top of the print. Because the ridges flow out the side of the print, the primary classification would be a plain arch and then referenced to a tented arch.

## Forensic Gerontology: A Podiatrist's Perspective of the Dynamic "Functioning" Foot and the Need for Research to Develop an Interpretive Approach

**Author(s):** Kagan, B.

**Type:** Commentary

**Published:** 2015, Volume 65, Issue 6, Pages 907-912

**Abstract:** Disclaimer: The opinions or assertions contained herein are the private views of the author and are not to be construed as official or reflecting the views of the New York College of Podiatric Medicine.

## The Fingerprint Evidence in the Trial of Dennis Gunn

**Author(s):** Turner, J. M.

**Type:** Case Report

**Published:** 2015, Volume 65, Issue 6, Pages 913-928

**Abstract:** This historical case report has been prepared to remember and recognize the excellent work carried out by a few pioneers of the "science of fingerprints" in New Zealand and our specialist role as latent print

examiners. The trial for Dennis Gunn, accused of murdering Mr. Augustus Briathwaite, the Ponsonby postmaster, in many ways is similar to a Daubert hearing, except that it occurred in 1920 in New Zealand, nearly 100 years ago. This report summarizes key elements of the fingerprint evidence and the resulting murder trial that led to the conviction and subsequent execution of Dennis Gunn. The trial considered issues such as the permanence and uniqueness of fingerprints, reliability of the evidence, forgery, proficiency testing, peer review, and the minimum number of points needed to individualize. At the conclusion of the trial, the Minister of Justice ensured that an authentic report of the trial was printed so that the evidence was available to the general public.

## Critical-Incident Trauma and Crime Scene Investigation: A Review of Police Organizational Challenges and Interventions

**Author(s):** Clark, R.; Distelrath, C.; Vaquera, G.; Winterich, D.; DeZolt, E.

**Type:** Article

**Published:** 2015, Volume 65, Issue 6, Pages 929-951

**Abstract:** It is hypothesized that exposure to critical-incident trauma affects crime scene investigators. Individual and organizational attribution factors are analyzed through the use of self-report data collected from crime scene investigators working in a large Midwestern state. This paper analyzes key variables in the job of a crime scene investigator in an effort to determine the level of stress related to CSI work and the nature of organizational support available to the investigator. Although initial findings suggest a high level of satisfaction with the job, the nature of the job can lead to high levels of both professional and personal stress, with work-related stress often driving personal stress. Policy implications for reducing officer stress as well as future research questions are discussed.

## Macroscopic Taphonomic Alterations to Human Bone Recovered from Marine Environments

**Author(s):** Pokines, J.; Higgs, N.

**Type:** Article

**Published:** 2015, Volume 65, Issue 6, Pages 953-984

**Abstract:** The present research examines a sample (n=25) of human bone cases that were recovered from the shoreline or ocean waters near Massachusetts, United States, and submitted for analysis to the Office of the Chief Medical Examiner, Boston. All macroscopic taphonomic changes resulting from the physical and biological effects of extended marine immersion were compiled and compared to taphonomic alterations from other environments. Multiple taphonomic characteristics were prevalent after extended marine immersion, including battering and rounding (96.0% of cases) and bleaching (88.0%), with adherence by marine species of mollusks (8.0%), barnacles (36.0%), and Bryozoans (4.0%), or, in some cases, surface alterations to bone by these adhering taxa. Other common changes included adipocere formation (20.0%); reddish (24.0%) or dark (12.0%) mineral staining; and adhering sand (52.0%), silt (8.0%), or algae and seaweed (36.0%). Bone condition (disregarding bleaching or staining) included still greasy because of leaching fat (32.0%), retaining an organic sheen (44.0%), or a chalky appearance (24.0%). Multiple traits may be used to distinguish a marine environment as the origin of unknown osseous remains from other common forensic sources, including terrestrial surface decomposition and weathering or buried remains.

## Investigating the Sensitivity of Cadaver-Detection Dogs to Decomposition Fluid

**Author(s):** Buis, R.; Rust, L.; Nizio, K.; Rai, T.; Stuart, B.; Forbes, S.

**Type:** Article

**Published:** 2015, Volume 65, Issue 6, Pages 985-997

**Abstract:** Cadaver-detection dogs are regularly used by police and emergency services to locate human remains. Because of ethical restrictions, the dogs are not trained using cadavers, but instead, on pseudo-scents or human tissues, such as blood, bone, and decomposition fluid. However, the accuracy of these training aids as substitutes for human remains is unknown. The aim of this study was to investigate the dogs' sensitivity to human decomposition fluid as a training aid and to determine whether their sensitivity increased with exposure.

Human decomposition fluid was collected and serially diluted to 1 part-per-trillion (10<sup>-12</sup>). The samples were presented to three cadaver-detection dog teams under standard indoor training conditions. The dogs were capable of detecting the lowest dilution levels and the smallest volumes of decomposition fluid after several exposures to the decomposition fluid samples. Ongoing training was deemed important to maintain this level of sensitivity. These findings support the use of human decomposition fluid as a valid training aid for cadaver-detection dogs.

## How Useful is Thematic Analysis as an Elicitation Technique for Analyzing Video of Human Gait in Forensic Podiatry?

**Author(s):** Browne, T.; Curran, M.; Vernon, D.

**Type:** Article

**Published:** 2015, Volume 65, Issue 6, Pages 999-1012

**Abstract:** The aim of this study was to evaluate how useful thematic analysis is in the elicitation of observations of gait from a video recording. This was undertaken by providing a video recording of human gait to "novice" and "expert" podiatry students. The observations were explored using the qualitative tool of thematic analysis. The exploration of human gait using this technique gave a rich abundance of information and demonstrated that a basic level of experience or knowledge is required to provide a simple description of human gait. With more expertise came a richer description of observation of human gait by the "expert" group compared to basic observations by the "novice" group. Thematic analysis allows the use of language and the depth of the information to be evaluated when observing human gait from a video recording.

## Rotating the Anterior View of a Skull into the Frankfort Horizontal Plane for Postmortem Drawings

**Author(s):** Murry, N.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 5, Pages 775-792

**Abstract:** It is commonly accepted that a profile view is needed in order to rotate the skull into the Frankfort horizontal plane, a more natural position in which to view the face. This technical note discusses a method to rotate the skull using only an anterior photograph.

## Forensic DNA Analysis from Rocks and Stones in Criminal Cases

**Author(s):** Avraham, S.; Berlyne, S.; Gafny, R.; Hazan-Eitan, Z.; Cohen, A.; Oz, C.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 5, Pages 793-801

**Abstract:** Rocks, although a problematic substrate for retrieval of DNA profiles, occasionally may be the missing link in providing a solution in specific forensic cases. Presented in this article is a developed protocol for approaching and analyzing such crime scene evidence, using moistened swabs for DNA collection. Results from real cases where this procedure was utilized on rocks were examined to determine the protocol's effectiveness.

## Applying Hill's Criteria to Determine the Validity of Cause and Effect Associations in Crime Scene Analysis

**Author(s):** Gardner, R. M.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 5, Pages 803-812

**Abstract:** Crime scene reconstruction involves evaluating causal connections between various actions that occur during a given incident. Analysts use critical thinking, logic, and a variety of techniques to accomplish this evaluation. An underlying concern in this process is contextual bias, which must be controlled to ensure that only

valid causal connections are included in the analysis. In 1965, Sir Austin Bradford Hill introduced a series of evaluative factors to use when evaluating causal connection in medicine. This paper describes Hill's criteria as they apply to crime scene reconstruction.

## Recovering Bloody Fingerprints from Skin

**Author(s):** Petretei, D.; Angyal, M.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 5, Pages 813-827

**Abstract:** Well-known processes for developing blood prints (i.e., amido black, leucocrystal violet, and Hungarian red) were tested to recover bloody fingerprints from cadaver skin. Several tests with varying quantities of blood on a thumb and fingers were tested to determine the most effective process. The process using Hungarian red proved to be the most successful and was then tested on living human skin, resulting in two of the five planted prints being identifiable.

## Development of Latent Prints on Tyvek Large Pak and Padded Pak Shipping Envelopes

**Author(s):** Merritt, D.; Morgan, J. P.; Houlgrave, S.; Ramotowski, R.; Brock, A.; Shelar, K.

**Type:** Article

**Published:** 2015, Volume 65, Issue 5, Pages 828-850

**Abstract:** In the past, attempting to develop latent prints on FedEx Tyvek Large Pak or Padded Pak shipping envelopes with processing techniques currently used for nonporous or semiporous items has yielded inconsistent results. The objective of this research was to determine the optimal technique(s) for the development of sebaceous and eccrine latent prints of various ages on these kinds of shipping envelopes. A comparison of the effectiveness of current processing methods, alone and in sequence, for porous, semiporous, and nonporous items, was conducted. The results indicate that diluted Wetwop was the most effective processing technique for the development of latent prints on Padded Pak envelopes. For Tyvek Large Pak envelopes, the modified Wetwop was found to work best.

## Variability and Subjectivity in the Grading Process for Evaluating the Performance of Latent Fingerprint Detection Techniques

**Author(s):** Fritz, P.; Frick, A. A.; van Bronswijk, W.; Lewis, S. W.; Beaudoin, A.; Bleay, S.; Lennard, C.

**Type:** Article

**Published:** 2015, Volume 65, Issue 5, Pages 851-867

**Abstract:** When assessing latent fingerprint development methods, forensic researchers commonly evaluate treated samples using a grading scale. However, the subjective nature of these evaluation methods leaves the results of such investigations open to criticism for potential grader bias. Assessment of fingerprint development quality is ultimately dependent on an individual's background and experience.

A pilot study was conducted as a preliminary stage of a large-scale international collaboration. A set of 80 fingerprint samples was developed with 1,2-indanedione-zinc chloride. Grades for photographic images of the developed fingerprints were assigned independently by 11 fingerprint researchers. Sixty-seven percent of the scores given to each individual sample were the same as the median grade, and 99% of the scores were within 1 grade. The researchers were also assessed on their consistency by including 20 duplicate images to be graded. Seventy-eight percent of the grades given were identical to their original scores.

These results indicate that a small group of independent fingerprint graders is sufficient to produce reliable and consistent data in projects requiring the assessment of fingerprint quality.

## Standardizing Shoemark Evidence—An Australian and New Zealand Collaborative Trial

**Author(s):** Raymond, J.; Sheldon, P.

**Type:** Article

**Published:** 2015, Volume 65, Issue 5, Pages 868-883

**Abstract:** Previously, Australian and New Zealand jurisdictions were operating with widely different conclusion scales and terminology in shoe and tire mark comparisons. This study compared the variability in responses to such comparisons through two collaborative trials of six comparison exercises. The first used the status quo in each jurisdiction; the second required respondents to use the conclusion scale recommended by the shoe and tire Scientific Working Group (SWGTHREAD) in the United States.

The adoption of the new conclusion scale greatly improved the clarity and comparability of conclusions. Excepting outliers that would likely be negated through technical reviews in casework, the range of conclusions for each comparison was slightly reduced in the second trial. Participants were observed to be conservative in their responses, erring on the side of exclusion rather than inclusion.

A significant observation is that close non-matches may not be detected, even by experienced examiners. It is essential that in conclusions of this type, the examiner makes clear to the court that another shoe of the same pattern and dimensions could have made the mark.

The benefits of a standard conclusion scale and terminology were made clear by this exercise, and therefore the new conclusion scale is recommended for use in Australia and New Zealand.

## Ghosting of Images in Barefoot Exemplar Prints Collection: Issues for Analyses

**Author(s):** Burrow, J. G.

**Type:** Article

**Published:** 2015, Volume 65, Issue 5, Pages 884-900

**Abstract:** This article analyzes a phenomenon that has been reported in only one other footprint collection article: Reel's thesis. The phenomenon is that of a ghost image that appears at the end of the toe impressions collected in two-dimensional exemplar footprints and found using two different collection methods. The collection methods were those of the Podotrack and the inkless shoe print systems. The footprints were collected in a dynamic phase of gait using a 4th step protocol. The great toe displayed the appearance of a ghost image more often than other toes, but all five **toes** can display the phenomenon. This phenomenon has implications for the collection and interpretation and thus the comparison made between unknown and known footprints in the criminal justice system. The Podotrack system appears to produce this phenomenon more often than the inkless shoe print system, but the phenomenon does not appear repeatable by participants and there are times where this occurs on only one occasion. There are differences between feet as well as between systems as to the appearance of the ghosting. (See letter to the editor by Dominique Holt in JFI 64 (3).)

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2015, Volume 65, Issue 5, Page 906

**Abstract:** A split or double right thumb with the corresponding record print showing two separate pattern types. The loop will be used for classification purposes and the outer whorl will be ignored.

## Front Matter

**Author(s):**

**Type:** Preface

**Published:** 2015, Volume 65, Issue 4, Pages 1-10

**Abstract:** During the 2014 annual conference, Past President Philip Sanfilippo suggested the possibility of having a special centennial issue. As the idea was pondered and informally discussed, it was quickly recognized as an idea that had to materialize. Immediately after the conference, the various Science and Practices

Subcommittees were asked to suggest articles that had been published in I.A.I. publications that were historically significant, notable, or represented progress and change during the last 100 years.

With the exception of the history of the association presented by our historian, Darrell R. Klasey, the following nearly five hundred pages represent a small portion of the information that has been previously published by the I.A.I.

### **The I.A.I. Through the Ages: A Century of Forensic Identification**

**Author(s):** Klasey, Darrell R.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 293-336

### **Henry Faulds, Finger-Print Pioneer**

**Author(s):** Cooke, T.G.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 337-344

**Abstract:** Reprinted from Finger Print Magazine, March 1925, 6 (9), 16–18, 31.

Note: Finger Print Magazine with T. G. Cooke as editor was the official publication of the International Association for Identification for one year.

### **Fingerprints and Penal Treatment**

**Author(s):** Castellanos, Israel, M.D.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 345-348

**Abstract:** Reprinted from the proceedings of the International Association for Identification Conference in Denver Colorado, September 12–15, 1928, pp 87–89

### **The Menace of the Pistol!**

**Author(s):** Goddard, Calvin

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 349-364

**Abstract:** Reprinted from the first issue of Sparks from the Anvil, Jan 1933, 1 (1), 3–7

### **Civil Identification**

**Author(s):** Hoover, John Edgar

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 365-369

**Abstract:** Reprinted from Sparks from the Anvil, May 1933, 1 (5), 4–5

### **Ballistics: A Test to Determine Whether or Not a Particular Person Has Recently Fired An Automatic Pistol. (The Test May Also Be Applied, in Some Instances, to Similar Questions Involving the Revolver.)**

**Author(s):** Wunderling, H.P.



**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 370-372

**Abstract:** Reprinted from Sparks from the Anvil, July 1933, 1 (7), 3

### Identification by Blood

**Author(s):**

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 373-374

**Abstract:** Reprinted from Sparks from the Anvil, July 1933, 1 (7), 4

### A Preliminary Test for Blood Stains

**Author(s):** Donaldson, Edwin R.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 375-378

**Abstract:** Reprinted from Sparks from the Anvil, June 1934, 2 (6), 5–6

### Transmit Finger Prints by Telegraph

**Author(s):**

**Type:** Advertisement

**Published:** 2015, Volume 65, Issue 4, Page 379

**Abstract:** Advertisement reprinted from Sparks from the Anvil, July 1934, 2 (7), 8

### Saved From Execution By Finger Prints

**Author(s):** Kuhne, Frederick

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 380-382

**Abstract:** Reprinted from Sparks from the Anvil, May 1936, 4 (5), 6

### Single Finger Print File

**Author(s):**

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 383-384

**Abstract:** Reprinted from I.A.I. newsletter, February 1943, 3–4

### Detecting Fraudulent Alterations on Paper and Documents by Chemical Means

**Author(s):** Dondero, John A.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 385-388

**Abstract:** Reprinted from I.A.I. newsletter, February 1944, 1–3

## Identification of Kidnaped Infant Accomplished by Means of Foot Impressions

**Author(s):** Kanz, George A.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 389-391

**Abstract:** Reprinted from I.A.I. newsletter, January 1945, 1–3

## Galton-Henry Pattern Definitions

**Author(s):** Bridges, B.C.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 392-395

**Abstract:** Reprinted from I.A.I. newsletter, July 1945, 5–7

## Barrel Length vs. Velocity

**Author(s):** Munhall, B.D.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Page 396

**Abstract:** Reprinted from Identification News, January 1952, 2 (1), 7

## Twins

**Author(s):** Cummins, Harold, Ph.D.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 397-404

**Abstract:** Reprinted from Identification News, February 1952, 2 (2), 3–5

## The Use of Infra-Red and Ultra-Violet Light in Law Enforcement Photography

**Author(s):** Tuttle, Harris B.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 405-413

**Abstract:** Reprinted from Identification News, February 1954, 4 (2), 6–8

## Conference Delegates

See "Electronic Fingerprints"

New Process Shown at Houston

**Author(s):**

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 414-415

**Abstract:** Reprinted from Identification News, November 1960, 10 (11), 10

## Present Status of the Ninhydrin Process For Developing Latent Fingerprints

**Author(s):** Shulenberg, William A.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 417-422

**Abstract:** Reprinted from Identification News, March 1963, 13 (3), 9–10, 14

### **Tire Tracks and Footwear Identification**

**Author(s):** Hamm, Ernest D.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 423-430

**Abstract:** Reprinted from Identification News, January 1975, 25 (1), 3–6

### **Bite Marks On Human Skin**

**Author(s):** Vale, Gerald L., D.D.S., M.D.S., J.D.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 431-440

**Abstract:** Reprinted from Identification News, May 1982, 32 (5), 10–13

### **The Identification of Vehicles from Wheelbase and Tire Stance Measurements**

**Author(s):** Bolhouse, Roger J.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 441-445

**Abstract:** Reprinted from Identification News, June 1984, 34 (6), 5–6.

### **Cyanoacrylate Fuming**

**Author(s):** Lee, Henry C., Ph.D; Gaensslen, R.E., Ph.D

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 446-459

**Abstract:** Reprinted from Identification News, June 1984, 34 (6), 8–14

### **20 Years of Excellence: The Administrative Advanced Latent Fingerprint School**

**Author(s):** Hazen, Robert J.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 461-468

**Abstract:** Reprinted from Journal of Forensic Identification, 1989, 39 (2), 107–113

## **Forensic Art: Defining the International Association for Identification's Ninth Discipline**

**Author(s):** Stewart, Karen Taylor; Richlin, Kevin Ross

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 469-488

**Abstract:** Reprinted from Journal of Forensic Identification, 1989, 39 (4), 215–230

## **Ridgeology**

**Author(s):** Ashbaugh, David R.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 489-538

**Abstract:** Reprinted from Journal of Forensic Identification, 1991, 41 (1), 16–64

## **The Use of Chiropody/Podiatry Records in Forensic and Mass Disaster Identification**

**Author(s):** Vernon, Wesley

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 539-553

**Abstract:** Reprinted from Journal of Forensic Identification, 1994, 44 (1), 26–40

## **Forensic Podiatry—An Emerging New Field**

**Author(s):** DiMaggio, John A., D.P.M.

**Type:** Guest Editorial

**Published:** 2015, Volume 65, Issue 4, Pages 554-556

**Abstract:** Reprinted from Journal of Forensic Identification, 1995, 45 (5), 495–497

## **A Review of the Sixteen Points Fingerprint Standard in England and Wales**

**Author(s):** Evett, I.W.; Williams, R.L.

**Type:** AfterWords Special Report

**Published:** 2015, Volume 65, Issue 4, Pages 557-580

**Abstract:** Reprinted from Journal of Forensic Identification, 1996, 46 (1), 49–73

## **Forensic Individualization of Images Using Quality and Quantity of Information**

**Author(s):** Vanderkolk, John R.

**Type:** Guest Editorial

**Published:** 2015, Volume 65, Issue 4, Pages 581-591

**Abstract:** Reprinted from Journal of Forensic Identification, 1999, 49 (3), 246–256

## **Direct Sensitivity Comparison of the Fluorescein and Luminol Bloodstain Enhancement Techniques**

**Author(s):** Cheeseman, Rob

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 593-599

**Abstract:** Reprinted from Journal of Forensic Identification, 1999, 49 (3), 261–268

## **People v. Jennings: A Significant Case for Fingerprint Science In America**

**Author(s):** Acree, Mark A.

**Type:** Historical Note

**Published:** 2015, Volume 65, Issue 4, Pages 600-602

**Abstract:** Reprinted from Journal of Forensic Identification, 1999, 49 (4), 455–457

## **Enhancement of Fingerprints in Blood–Part 2: Protein Dyes**

**Author(s):** Sears, Vaughn G.; Butcher, Colin P. G.; Prizeman, Tania M.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 603-613

**Abstract:** Reprinted from Journal of Forensic Identification, 2001, 51 (1), 28–38

## **Survey of Tire Tread Design and Tire Size as Mounted on Vehicles in Central Iowa**

**Author(s):** Bessman, Carl W.; Schmeiser, Amy

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 615-623

**Abstract:** Reprinted from Journal of Forensic Identification, 2001, 51 (6), 587–596

## **IAFIS Fingerprint Search Solves 45-Year-Old Double Police Officer Murder**

**Author(s):** Leo, William F.; Tillman, Steven

**Type:** Case Report

**Published:** 2015, Volume 65, Issue 4, Pages 624-629

**Abstract:** Reprinted from Journal of Forensic Identification, 2003, 53 (4), 397–403

## **Integrating DNA Collection into the Latent Print Section**

**Author(s):** Amick, Janeice; Bivins, Dale; Cathcart, Kerrie; Hammer, Lesley; Pippin, Turner

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 4, Pages 630-637

**Abstract:** Reprinted from Journal of Forensic Identification, 2004, 54 (2), 170–177

## **Recovery of Latent Prints from Human Skin**

**Author(s):** Sampson, William C.; Sampson, Karen L.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 638-661

**Abstract:** Reprinted from Journal of Forensic Identification, 2005, 55 (3), 362–385

## **A Modified Method for Purification of Biological Samples Collected on FTA Cards for STR Analysis**

**Author(s):** Barash, Mark; Shpitzen, Moshe; Gafny, Ron; Zamir, Ashira

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 4, Pages 662-670

**Abstract:** Reprinted from Journal of Forensic Identification, 2006, 56 (2), 222–231

## **Footwear Examinations: Mathematical Probabilities of Theoretical Individual Characteristics**

**Author(s):** Stone, Rocky S.

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 671-692

**Abstract:** Reprinted from Journal of Forensic Identification, 2006, 56 (4), 577–599

## **STR Analysis Following Latent Blood Detection by Luminol, Fluorescein, and BlueStar**

**Author(s):** Jakovich, Cathy J.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 4, Pages 693-698

**Abstract:** Reprinted from Journal of Forensic Identification, 2007, 57 (2), 193–198

## **Effect of Photographic Technology on Quality of Examination of Footwear Impressions**

**Author(s):** Blitzer, Herbert; Hammer, Richard; Jacobia, Jack

**Type:** Technical Note



**Published:** 2015, Volume 65, Issue 4, Pages 699-715

**Abstract:** Reprinted from Journal of Forensic Identification, 2007, 57 (5), 641–657

### **Quantification of the Individual Characteristics of the Human Dentition**

**Author(s):** Johnson, L. Thomas; Radmer, Thomas W.; Wirtz, Thomas S.; Pajewski, Nicholas M.; Cadle, David E.; Brozek, James; Blinka, Daniel D.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 4, Pages 716-732

**Abstract:** Reprinted from Journal of Forensic Identification, 2009, 59 (6), 609–625

### **A 37-Year-Old Cold Case Identification Using Novel and Collaborative Methods**

**Author(s):** Wedel, Vicki L.; Found, Garry; Nusse, Gloria

**Type:** Case Report

**Published:** 2015, Volume 65, Issue 4, Pages 733-749

**Abstract:** Reprinted from Journal of Forensic Identification, 2013, 63 (1), 5–21

### **An Overview of Forensic Art**

**Author(s):** Birdwell, Suzanne Low

**Type:** Article

**Published:** 2015, Volume 65, Issue 4, Pages 750-760

**Abstract:** Reprinted from IDentification News, 2013, 43 (5), 8–12.

### **Back to Basics: 1985 to 2015**

**Author(s):**

**Type:** Back to Basics

**Published:** 2015, Volume 65, Issue 4, Pages 764-774

**Abstract:** On the pages following the initial Back to Basics print (opposing page) are some of the more amusing QUIPs that have been presented by our past and present coordinators.

### **The Emerging Paradigm Shift in the Epistemology of Fingerprint Conclusions**

**Author(s):**

**Type:** Commentary

**Published:** 2015, Volume 65, Issue 3, Pages 201-213

**Abstract:** The forensic fingerprint discipline is on the verge of a new paradigm. This paradigm challenges the epistemic rationale of traditional fingerprint conclusions based solely on the intuition of fingerprint practitioners, and instead encourages the integration of empirical measurements and probabilistic reasoning [1–4]. The result

is a shift away from categorical conclusions having statements of absolute certainty, zero error rate, and the exclusion of all individuals to a more modest and defensible framework integrating empirical data for the evaluation and articulation of fingerprint evidence. Although the fingerprint discipline should be commended for the progress made to date, this is only the beginning of a much larger journey forward. This commentary will briefly (1) discuss the emergence of this new paradigm, traversing from its extreme rejections to its gradual acceptance, (2) compare the transition that is occurring within the fingerprint community to a similar shift that occurred within the medical community two decades prior, (3) comment on the similarities between the progress of these paradigm shifts and that described by Thomas Kuhn as normal and expected during the course of paradigm shifts in the scientific community, and (4) recommend how the fingerprint community may continue to move forward.

## Development of Latent Fingerprints from Stones: Field Work Provides Identifications

**Author(s):** Hefetz, I.; Pertsev, R.; Bar-sheshet, E.

**Type:** Case Report

**Published:** 2015, Volume 65, Issue 3, Pages 214-218

**Abstract:** Previous studies have shown that the use of black magnetic powder for nonporous stones and the use of ninhydrin for porous stones yield fingerprints of good evidentiary value. These techniques were applied by crime scene investigators and resulted in the development of identifiable prints and the identification of several criminals. Three cases of latent fingerprint development from stones are reported.

## Dye Staining of Duct Tape: An Overlooked Procedure

**Author(s):** Olenik, J.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 3, Pages 219-221

**Abstract:** By changing the carrier solution of the popular dye basic yellow 40, one is able to develop latent prints on problematic surfaces such as the adhesive side, as well as the smooth side, of duct tape. The tape has to be properly fumed with cyanoacrylate vapors before the dye is applied. After dyeing, the tape is aggressively rinsed, followed by drying. The developed prints are fluorescent under blue light as well as under a forensic light source in the 415 nm to 485 nm range and viewed with yellow or orange goggles. These prints are easily photographed.

## Identification of Nonhuman Remains Received in a Medical Examiner Setting

**Author(s):** Pokines, J.T.

**Type:** Article

**Published:** 2015, Volume 65, Issue 3, Pages 223-246

**Abstract:** Forensic cases of skeletal or partially decomposed remains are frequently identified as nonhuman by forensic anthropologists or pathologists working in medical examiner or similar settings. Knowledge regarding which nonhuman species are turned in at the highest frequencies in a given region therefore will be useful for training forensic practitioners in nonhuman bone identification and lead to faster case resolution. The present research examined  $n = 355$  cases turned over to the Office of the Chief Medical Examiner, Boston, from all jurisdictions in the Commonwealth of Massachusetts. The majority were received from November 2011 through October 2014, although some older cases were also included. The vertebrate species community in this northeastern United States region reflects the multiple environments throughout the state, including woodland, agricultural, and marine. The introduced domestic species cattle (*Bos taurus*) and pig (*Sus scrofa*) and abundant wild species white-tailed deer (*Odocoileus virginianus*) were the top three taxa identified, and in general introduced domestic species dominated the profile. Nonhuman animal remains derived from accidental

excavation of archaeological or historical midden deposits were an important source of skeletal remains, as was recent food waste. Although the majority of remains turned in for examination were comparable in size to adult humans, smaller taxa also contributed a significant proportion of the overall case sample. Forensic practitioners in regions with similar species populations may encounter nonhuman taxa at broadly similar rates. Forensic education programs should include a focus on their identification, because nonhuman cases may comprise a significant portion of overall casework.

## Chemical Enhancement of Footwear Impressions in Blood Recovered from Cotton using Alginate Casts

**Author(s):** Jurgens, E.; Hainey, A.; Shaw, L.; Andries, J.

**Type:** Article

**Published:** 2015, Volume 65, Issue 3, Pages 247-272

**Abstract:** Depletion series of footwear impressions in blood were deposited on black cotton fabric after which they were lifted using alginate and subsequently enhanced using protein stains amido black (AB), Crowle's stain (CS), coomassie blue (CB), and Hungarian red (HR). Other factors that were considered during this study were the age of the impression and the temperature of the environment. A novel score system for the enhancement of footwear impressions was introduced, which used the product of scores for size and detail of the impression.

The study showed that temperatures between 8 °C and 37 °C did not impact chemical enhancement, whereas the age of the impression did. An impression aged for 7 days yielded higher enhancement scores than impressions aged for 1 or 28 days, especially for AB. The results of depletions 1 to 5 were similar to the results of only depletion 5. However, at depletion 5, AB was the best-performing protein stain.

CB and AB yielded the highest level of enhancement of the impressions, whereas CS and HR resulted in poorer quality enhancements. AB was the preferred protein stain of use because AB was the most sensitive protein stain used in this study and there were fewer health risks involved in using water-based AB than in using methanol-based CB.

## The Ability of Footwear to Produce Impressions of Good Detail in Sandy Soil Substrates

**Author(s):** Snyder, C.

**Type:** Article

**Published:** 2015, Volume 65, Issue 3, Pages 273-288

**Abstract:** Seven different sandy soils were utilized to create three-dimensional footwear impressions from two athletic shoes (Saucony and New Balance). The footwear impressions were photographed and cast with dental stone. The impressions made in the fill dirt and the yellow builders sand retained the most randomly acquired characteristics. The impressions made in the Astatula fine sand and the crushed coquina retained the least randomly acquired characteristics. The results indicated that (1) soils with larger particles or very fine sand may retain less randomly acquired characteristics (fine detail) than other sandy soils, thus affecting the ability of the impression to retain good detail; (2) soils with higher clay or organic contents will retain more randomly acquired characteristics; and (3) impressions located in a variety of sandy soil types have the ability to retain a sufficient number of randomly acquired characteristics to effect an identification.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2015, Volume 65, Issue 3, Page 292

**Abstract:** A cool whorl in the hypothenar area of the palm.

## **The Efficacy of Blue Star Forensic on Wood Floors Coated with Lacquer and Shellac: A Cold Case in Progress**

**Author(s):** Smith, K.

**Type:** Case Report

**Published:** 2015, Volume 65, Issue 2, Pages 097-105

**Abstract:** Blue Star Forensic is used to locate trace amounts of human blood at crime scenes. This experiment was constructed as the result of research into a cold case from 1963, where the victim was stabbed to death in her home. Primary information indicated that attempts were made by family members to clean areas of pooled and dripped bloodstains four days after the crime. Years later, the floor was refinished. Viewing of crime scene photos, case documents, and access to the remaining physical evidence, including the victim's clothing, assisted the author in the development of a reconstruction theory and this experiment to test the possibility of finding remaining bloodstains at the original scene. Blue Star Forensic proved valuable in uncovering new forensic possibilities for this case.

## **The Utility of Baking Bone to Increase Skeletal DNA Yield**

**Author(s):** Madonna, M.E.; Latham, K.E.; Nawrocki, S.P.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 2, Pages 107-117

**Abstract:** It is well established that DNA extracted from both soft and hard tissues can contribute to criminal investigations. In many cases, the skeleton is the only biological material remaining at the crime scene and is therefore a target for genetic analyses aimed at individual identification. However, isolating DNA from osseous tissue can be challenging. Although heat is known to accelerate DNA degradation, recent information suggests that controlled heating of bone may be beneficial in increasing skeletal DNA yields. Heating appears to make the osseous material more brittle and therefore better able to release the DNA, although the quality of the resulting purified skeletal DNA may not be good enough to amplify for subsequent genetic analyses. This study systematically tests the influence of baking on the quantity and quality of extracted skeletal DNA. We conclude that baking bones for up to 72 hours prior to DNA extraction can increase DNA yield with no discernible influence on DNA quality. The increase in yield with heating is especially marked in samples that start out with low (less than 1.0 ug/mL) initial yields.

## **Single-Metal Deposition for Fingerprint Detection—A Simpler and More Efficient Protocol**

**Author(s):** Moret, S.; Bécue, A.

**Type:** Article

**Published:** 2015, Volume 65, Issue 2, Pages 118-137

**Abstract:** This publication presents the latest optimization of the single-metal deposition technique (SMD II) and its comparison with the previous version (SMD I). In this study, endeavors were made to simplify and strengthen both the reagents and the detection procedure to obtain a technique that can be implemented in a standard operational laboratory. As a result, the proposed technique is simpler and faster because the monitoring of both temperature and pH is no longer required. Most importantly, the technique is (1) more efficient, with at least ca.

50% more marks detected with SMD II in comparison with SMD I (% obtained by using split marks) and (2) more robust regarding the processing of porous samples.

## Feasibility Studies for Fingermark Visualization on Leather and Artificial Leather

**Author(s):** Downham, R.P.; Kelly, S.; Sears, V.G.

**Type:** Article

**Published:** 2015, Volume 65, Issue 2, Pages 138-159

**Abstract:** A study was undertaken to investigate the effectiveness of 14 fingermark visualization processes on fresh (24 hours old) natural fingermarks deposited on newly purchased leather items. The primary focus of this study was leather, but artificial leather (or faux leather) was also included given that both are considered to be challenging surface materials for fingermark visualization. Superglue fuming and iron oxide powder suspension were the only processes that visualized fingermarks of identifiable quality on leather, although the recovery rates were very low (4.2% and 12.5%, respectively). These processes were further investigated (along with carbon powder suspension) on an extended range of items with natural marks aged for 2 days and 1 week. Fingermarks of identifiable quality were visualized on leather by all three processes after 2 days of aging, but after 1 week, only iron oxide powder suspension was able to visualize marks (although recovery rates continued to be very low). Superglue fuming and the powder suspensions also demonstrated fingermark visualization capability on the artificial leather samples (with better recovery rates), and hence may be worthy of further investigation for use operationally where it can be difficult to distinguish between the genuine leather and artificial leather.

## A Procedure for Processing Outdoor Surface Forensic Scenes Yielding Skeletal Remains Among Leaf Litter

**Author(s):** Pokines, J.T.

**Type:** Article

**Published:** 2015, Volume 65, Issue 2, Pages 161-172

**Abstract:** Although the general procedures of surface search for clandestine burials and surface remains and the forensic archaeological procedures for mapping, collecting, and excavating sites are well established, detailed procedures for the initial phase of outdoor forensic surface scene processing are generally lacking. The method described here is for outdoor, surface, skeletonized remains that have a central concentration and surrounding dispersed remains and other evidence with overlying obscuring leaf litter. The method proposed here includes inward clearance of the main concentration first, reversal of course outward to recover scattered items surrounding the main concentration, and safe discard of leaf litter onto a previously cleared area, followed by mapping of exposed items and, if required, excavation. The author refers to this method as the "inside-out" process for surface forensic scene processing. The method should be used as one portion of an integrated forensic archaeological system of outdoor evidence and data collection.

## Taphonomic Characteristics of Former Anatomical Teaching Specimens Received at a Medical Examiner's Office

**Author(s):** Pokines, J.T.

**Type:** Article

**Published:** 2015, Volume 65, Issue 2, Pages 173-195

**Abstract:** Human skeletal remains that had originally been prepared and used as anatomical teaching specimens are sometimes mistaken for cases of forensic interest and are turned over for forensic anthropological analysis. The present sample (24 cases) was analyzed for the overall taphonomic patterns that may be useful in establishing their origins. Findings consist of multiple characteristics that, when considered as a

pattern, are unique to anatomical teaching specimens and include mounting hardware, drilling, sectioning, plastic reconstruction, and labeling. Other taphonomic changes observed in this sample, but not unique to anatomical specimens, include patina formation, shelf wear, and the repurposing of the bones for decoration or display. The overall taphonomic characteristics should be used in conjunction with ancestry estimation and contextual information to help designate unknown cases as former anatomical teaching specimens.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2015, Volume 65, Issue 2, Page 200

**Abstract:** This print falls into the unusual and interesting category because the pattern type is not questionable. It is an accidental whorl with an outer tracing. There are three deltas present as well as two separate pattern types. It appears to be rolled beyond a normal width so a reference to a seven count loop should be considered as well as a plain whorl, depending on what side of the finger was recorded.

## Laterally Reversed Fingerprints Detected in Fake Documents

**Author(s):** Girelli, Carlos Magno A.

**Type:** Case Report

**Published:** 2015, Volume 65, Issue 1, Pages 001-017

**Abstract:** Cases involving laterally reversed fingerprints have been previously reported in the literature. In general, they are detected only when the expert already has suspects and is able to analyze the latent prints' substrate. This case is about the analysis of hundreds of copies of supposedly fake identity documents in which reversed fingerprints were detected, not from characteristics of the substrate, but because of the attention paid by experienced experts during all stages of their work. Some difficulties associated with the detection of laterally reversed fingerprints are discussed in terms of visual perception, contextual bias, operational procedures, automated fingerprint identification system (AFIS), and accuracy of decision making based on costs and benefits. Possible solutions for avoiding errors when dealing with probable lateral reversals are discussed: (1) applying the ACE-V methodology with blind verification and (2) in specific circumstances, performing comparisons with both direct and reversed prints and storing them in AFIS (if possible) to allow for future comparisons.

## Factors Affecting the Near-Infrared Photography of Bloodstains

**Author(s):** Connor, M.; Mendecki, L.; Cordiner, S.

**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 1, Pages 019-033

**Abstract:** Near-infrared (NIR) photography can be used to detect bloodstains on dark fabrics that are otherwise difficult to view with the naked eye. This technique is often successful, but may fail to detect all bloodstains that are present on a surface. We identify the factors that determine the success of NIR photography, which include the type of fabric, the effect of dyes in the fabric, and the type of bloodstains that are deposited on the fabric.

## Developing Latent Fingermarks on Thermal Paper: Comparison of the 1,2-Indanedione-Zinc Chloride Dry Contact Method to the Hot Print System

**Author(s):** Goel, Tara L.



**Type:** Technical Note

**Published:** 2015, Volume 65, Issue 1, Pages 034-043

**Abstract:** Developing latent fingerprints on thermal paper has become an issue for forensic investigators, because using organic development methods causes a premature discoloration on the heat-sensitive layer of the thermal paper. The purpose of this study was to experimentally determine whether there was a statistical difference in the development of latent fingerprints on thermal paper between the 1,2-indanedione-zinc chloride (IND-Zn) dry contact method and the Hot Print System (HPS). One participant deposited 100 fingerprints on thermal paper 24 hours and 5 days before development. The fingerprints were then cut in half lengthwise for a total of 200 half prints. Of these half prints, 100 from the left side of the paper were developed by the HPS (50 were developed 24 hours after deposition and 50 were developed 5 days after deposition). The same procedure was applied with the IND-Zn method, but using the right side of the paper. Fingerprints were then graded using the CAST scale criteria. Conducting a binary logistic regression showed that the IND-Zn method enabled the development of superior prints ( $p < 0.05$ ) at both time intervals. A binary logistic regression was also used to determine whether time since deposition affected ridge detail development, regardless of method used. It was thus determined that fingerprints developed 24 hours after deposition had more ridge detail visibility ( $p < 0.05$ ) than those developed 5 days after deposition. Once developed, the prints developed by the IND-Zn method had improved ridge detail visibility over time, whereas prints developed using the HPS faded with time.

## The Use of Natural Yellow 3 (Curcumin) for the Chemical Enhancement of Latent Friction Ridge Detail on Naturally Weathered Materials

**Author(s):** Perry, H.; Sears, V. G.

**Type:** Article

**Published:** 2015, Volume 65, Issue 1, Pages 045-066

**Abstract:** This study investigating the use of natural yellow 3 (curcumin, CI 75300) for the enhancement of latent friction ridge detail builds on earlier work. An optimized formulation is developed and it is used to visualize both sebaceous groomed and natural fingerprints on examples of metals and rigid plastics that had been naturally weathered for several months outside in the United Kingdom before fingerprint deposition. We also show that natural yellow 3 has the potential to be used as an alternative to solvent black 3 or used after it as part of a processing sequence to maximize fingerprint development.

## Evaluation of a Solvent-Free p-Dimethylaminobenzaldehyde Method for Fingerprint Visualization with a Low-Cost Light Source Suitable for Remote Locations

**Author(s):** Fritz, P.; van Bronswijk, W.; Dorakumbura, B.; Hackshaw, B.; Lewis, S. W.

**Type:** Article

**Published:** 2015, Volume 65, Issue 1, Pages 067-090

**Abstract:** The guidelines set forth by the International Fingerprint Research Group (IFRG) were used to plan and conduct the evaluation of a dry contact p-dimethylaminobenzaldehyde (DMAB) approach to the treatment of latent fingerprint deposits on porous substrates. It was found that the IFRG guidelines provided a practicable framework for the implementation of method optimization and comparison studies. Extensive investigations into the development method and its subsequent use across a range of conditions and substrates showed that the dry contact DMAB method is not as sensitive as the recommended ninhydrin techniques. Illumination in the form of an inexpensive LED light source was shown to be a promising alternative to the much more expensive Rofin Polilight, especially in teaching or remote environments.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2015, Volume 65, Issue 1, Page 096

**Abstract:** This is a very nice example of a double loop whorl. What's interesting is the tracing, because there is no upward trend. To find the tracing, you would still start with the left delta and continue tracing until a point opposite the right delta, or the delta itself, is reached. The tracing for this print would be an inner tracing. It would be referenced to a loop because there is only one good recurve in front of the left delta.

## Accidental Characteristics — Not Just for Footwear

**Author(s):** Dodds, W.

**Type:** Case Report

**Published:** 2014, Volume 64, Issue 6, Pages 517-522

**Abstract:** The process of using class and accidental characteristics to identify footwear and other forensic evidence is commonly used by forensic identification specialists throughout the world. This case outlines and discusses the process used to identify a suspect motorcycle in a dangerous operation of a motor vehicle incident. The case involved the review of a video made by the suspect that was subsequently posted on the "You Tube" internet site.

## New Forensic Perspective for Fast Blue B: From Cannabinoid Reagent in Toxicology to Latent Fingerprint Developer in Drug Cases

**Author(s):** Zampa, F.; Furlan, G.; Furlan, G.; Bellizia, M.; Iuliano, G.; Ripani, L.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 6, Pages 523-535

**Abstract:** This research investigated using Fast Blue B (FBB) [o-Dianisidine bis (diazotized) zinc double salt] to develop fingerprints contaminated by the active constituents of Cannabis sativa L. Cannabis-contaminated fingerprints were placed on various porous and nonporous surfaces and were processed with FBB. Specificity tests (using 50 volunteers) and 100-day aging tests were conducted on white paper. The FBB solution developed the contaminated fingerprints on each surface, as well as on all samples during the aging test. The specificity tests had no false-positive reactions, which suggests the potential use of FBB in cases where an association of the actual drug handling, versus drug container handling, is desired.

## Preliminary Investigations into a Commercial Thermal Fingerprint Developer for the Visualization of Latent Fingermarks on Paper Substrates

**Author(s):** Fritz, P.; van Bronswijk, W.; Fisher, D.; Lewis, S.

**Type:** Article

**Published:** 2014, Volume 64, Issue 6, Pages 536-555

**Abstract:** The Thermal Fingerprint Developer (TFD-2) developed by Foster and Freeman is the first commercially available instrument to solely utilize heat treatment to visualize latent fingermarks. The chemical-free TFD-2 was able to develop latent fingermarks on a variety of substrates. The manufacturer's guidelines with regard to the optimal treatment settings were suitable for the more common substrates such as white copy paper; however, new protocols were required for the treatment of thermal paper. The TFD-2's ability to develop these samples and its use in sequence with traditional chemical reagents, such as 1,2-indanedione and physical developer, were demonstrated. The thermal developer may offer quick and easy heat application options for existing fingermark development reagents. However, the TFD-2-developed samples lacked the detail and contrast afforded by conventional amino acid-sensitive reagents under most conditions.

## Pseudo-Operational Trials of Lumicyano Solution and Lumicyano Powder for the Detection of Latent Fingermarks on Various Substrates

**Author(s):** Farrugia, K.; Fraser, J.; Calder, N.; Deacon, P.

**Type:** Article

**Published:** 2014, Volume 64, Issue 6, Pages 556-582

**Abstract:** This study presents pseudo-operational trials comparing a one-step fluorescent cyanoacrylate process with a number of other enhancement techniques on a variety of substrates. This one-step process involves a product, 4% Lumicyano, which is a solution consisting of 4% by weight of a powdered dye (Lumicyano powder) dissolved in a cyanoacrylate-based solution (Lumicyano solution). The cyanoacrylate in the Lumicyano solution may be of a higher quality than that used in the two-step products.

## Chemical Enhancement of Soil-Based Marks on Nonporous Surfaces Followed by Gelatin Lifting

**Author(s):** Hammell, L.; Deacon, P.; Farrugia, K.

**Type:** Article

**Published:** 2014, Volume 64, Issue 6, Pages 583-608

**Abstract:** This study assessed the use of processing techniques (potassium thiocyanate, 2-2-dipyridil, potassium ferrocyanide, ammonium pyrrolidinedithiocarbamate, safranin, magnetic powder) for the enhancement of soil-based marks on nonporous surfaces, followed by gelatin lifting for the recovery of these marks. Other variables in the study included the use of nonporous substrates with varying colors (ceramic tiles, glass, linoleum, plastic bags, leaflets) and different aging periods (1, 7, 14, and 28 days) prior to enhancement and gelatin lifting. A numerical grading system from -1 (deterioration) to 4 (recovery of all fine detail) was adopted to assess the quality of the enhancement achieved.

In this study, the two most effective chemical enhancement techniques for soil-based marks on nonporous surfaces were safranin and potassium thiocyanate, specifically on grey linoleum and white ceramic tiles. One-day aging of soil-based marks provided poor results, whereas 28-day aging periods provided superior enhancement. In general, lifting with gelatin lifts provided further improvement on the initial enhancement, by means of contrast and sharpness. However, the use of gelatin lifting sometimes resulted in the deterioration of the original mark. Marks treated with safranin and lifted with white gelatin lifts provided even further improvement through fluorescence examination.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2014, Volume 64, Issue 6, Page 612

**Abstract:** This print is a loop first and then referenced to a central pocket whorl because the core is on the only recurring ridge. The fun things about it are the letters "G" and "Y".

## Exploring the Potential of a Wet-Vacuum Collection System for DNA Recovery

**Author(s):** Garrett, A.D.; Patlak, D.J.; Gunn, L.E.; Brodeur, A.N.; Grgicak, C.M.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 5, Pages 429-448

**Abstract:** Traditional biological collection methods are compared to a wet-vacuum system through the collection of different volumes of blood on tile, denim, and carpet. The wet-vacuum technique was able to recover sufficient amounts of blood for Kastle-Meyer presumptive testing. Although it was possible to detect blood after wet-vacuum collection, swabbing resulted in the highest rate of positive results for the presumptive test.

The DNA yields and detection limits that were obtained when collecting from tile were similar between methods, suggesting they are equivalent in their ability to collect DNA from nonporous surfaces. When the techniques were tested on mock case surfaces, wet-vacuum collection resulted in higher DNA yields than either the double swab or taping methods. However, STR profiles that were obtained from these mock surfaces exhibited extraneous alleles at many loci, suggesting that these higher yields were the result of collecting DNA already present on the substrate.

The wet-vacuum collection efficacy was further tested by examining yields that were obtained when semen and blood were collected from tile, denim, carpet, and brick. Results show that the technique was successful in collecting DNA from all surfaces, although the yield from brick varied widely and was low compared to the other substrates. Of the 16 low-volume samples collected from brick, 8 resulted in no detectable DNA.

Tests that examined the wet-vacuum technique's propensity to spread sample were also performed and demonstrated that DNA was detected up to 4 inches from the collection site, suggesting caution must be taken if collecting biological evidence that is in the vicinity of another probative sample.

## Sex Determination through Cephalofacial Measurements

**Author(s):** Agnihotri, A.K.; Jowaheer, V.; Kachhwaha, S.; Allock, A.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 5, Pages 449-458

**Abstract:** This study aimed at using cephalofacial measurements to determine sex in the Indo-Mauritian population. Several indices were created using these measurements and were analyzed to identify the indices that would be useful statistically to differentiate males from females. A binary logit model was developed and used to evaluate the importance of the indices. The results indicated that three indices — cephalic, nasal, and facial — contribute significantly to the determination of sex in the population that was investigated.

## Enhancement of Three-Dimensional Fabric Marks on Paint-Coated Surface of a Car

**Author(s):** Cohen, A.; Grafit, A.; Cohen, Y.; Shor, Y.; Wiesner, S.

**Type:** Article

**Published:** 2014, Volume 64, Issue 5, Pages 459-474

**Abstract:** It was assumed that the high impact involved in car versus pedestrian accidents creates a microtexture imprint of the victim's clothing on the car. This texture was detected using a scanning electron microscope (SEM). Then small particle reagent (SPR) was successfully used to enhance fabric impressions. It is suggested that SPR fills in the three-dimensional imprint because of the physical characteristics and particle shape of MoS<sub>2</sub>, which is the active component of SPR, thereby enhancing the appearance of the impression.

## Influence of BlueStar Reagent on Blood Spatter Stains on Different Fabrics

**Author(s):** Grafit, A.; Gronspan, A.; Rosenberg, T.; Eitan, Z.H.

**Type:** Article

**Published:** 2014, Volume 64, Issue 5, Pages 475-488

**Abstract:** Often crime scene investigators must discover blood spatter that is not obvious to the human eye to obtain DNA and to analyze spatter patterns. Experiments show that the spraying of Bluestar on fabrics visually enhances blood spatter and that appropriate use of Bluestar does not alter the shape, size, directionality, or appearance of bloodstains on fabric, and thus the stains can be analyzed properly.

## Detection of Cadaveric Remains by Thermal Imaging Cameras

**Author(s):** DesMarais, A.M.

**Type:** Article

**Published:** 2014, Volume 64, Issue 5, Pages 489-510

**Abstract:** This study was conducted to determine whether thermal imaging (TI) could be useful in locating human remains. Cadavers of seven *Sus scrofa domestica* were used during the autumn season in a wooded area of southern New England. Temperatures of the cadavers (core and external), insect larval mass, and ambient air were taken twice daily; TI was performed once weekly. The control subject was saturated with insect repellent to differentiate decompositional temperature fluctuations from insect larval temperature fluctuations. A significant temperature difference was found between larval masses and environmental temperatures. TI was successful in detecting thermal emissions from all insect larval masses and differentiating the remains from the surrounding environment.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2014, Volume 64, Issue 5, Page 516

**Abstract:** This pattern appears to be a birth defect so it would follow the rules for scarred, amputation, and missing at birth.

## Fingerprint Detection on Thermal Papers: Proposition of an Updated Processing Sequence

**Author(s):** Fitzi, T.; Fischer, R.; Moret, S.; Bécue, A.

**Type:** Article

**Published:** 2014, Volume 64, Issue 4, Pages 329-350

**Abstract:** The detection of latent fingerprints on thermal papers proves to be particularly challenging because the application of conventional detection techniques may turn the sample dark grey or black, thus preventing the observation of fingerprints. Various approaches aiming at avoiding or solving this problem have been suggested. However, in view of the many propositions available in the literature, it gets difficult to choose the most advantageous method and to decide which processing sequence should be followed when dealing with a thermal paper.

In this study, 19 detection techniques adapted to the processing of thermal papers were assessed individually and then were compared to each other. An updated processing sequence, assessed through a pseudo-operational test, is suggested.

## Sulfosalicylic Acid and Rhodamine 6G as a Fixing and Development Solution for the Enhancement of Blood Impressions

**Author(s):** McCarthy, D.

**Type:** Article

**Published:** 2014, Volume 64, Issue 4, Pages 351-374

**Abstract:** The use of 5-sulfosalicylic acid (SSA) in blood enhancement reagents acts as a stabilizer to the proteins in blood impressions so that they may be further developed. In an attempt to provide an improved method to achieve luminescence from blood impressions, zinc chloride (ZnCl<sub>2</sub>) and rhodamine 6G (R6G) were evaluated in different SSA formulations. R6G proved to be a more effective addition to the SSA fixing solution. This stain produced consistent luminescence on blood impressions, with luminescence achieved by both conventional forensic light sources and a TracER laser. The SSA + R6G solution was tested in sequence with both amido black and leucocrystal violet (LCV) reagents and did not inhibit the reaction of either blood reagent with blood impressions. Further, the SSA + R6G solution, when used as a fixative prior to LCV application, also improved the ability to generate and capture the luminescence of LCV.

## Recommended Protocols for Fingerprint Detection on Canadian Polymer Banknotes—Part I: Chemical Development

**Author(s):** Lam, R.; Wilkinson, D.; Tse, T.; Pynn, B.

**Type:** Article

**Published:** 2014, Volume 64, Issue 4, Pages 375-401

**Abstract:** Polymer banknotes were first introduced in Canada, with the \$100 denomination banknote, in 2011. Part I of this research compares split depletion latent prints, stored under ambient conditions for up to 14 days prior to development, from multiple donors on handled and unhandled \$50 a-trial notes, to determine the most effective fingerprint development technique sequence currently available in Canada. The recommended protocols involve sequential processing with cyanoacrylate fuming, vacuum metal deposition, and fluorescent dye staining. It is important to process the banknotes with cyanoacrylate fuming as soon as possible to minimize print degradation. Optimal lighting and photography conditions, as well as some digital enhancement techniques are discussed in Part II. The Royal Canadian Mounted Police is monitoring the treatment of seized polymer banknotes to validate the recommended protocols.

## Recommended Protocols for Fingerprint Detection on Canadian Polymer Banknotes—Part II: Photography, Lighting, and Digital Enhancement Techniques

**Author(s):** Lam, R.

**Type:** Article

**Published:** 2014, Volume 64, Issue 4, Pages 402-422

**Abstract:** Polymer banknotes have been in circulation within Canada since 2011. The objective of this research was to determine optimal lighting conditions while examining and photographing impressions, including the use of infrared photography, detected by the following development sequence: cyanoacrylate fuming, vacuum metal deposition, and fluorescent dye staining. Some useful digital enhancement techniques using Adobe Photoshop CS5 were also explored, such as channel selection, image subtraction, and perspective crop.

## Back to Basics

**Author(s):** Siegel, S.



**Type:** Back to Basics

**Published:** 2014, Volume 64, Issue 4, Page 428

**Abstract:** This impression has two equally good looping formations but only one delta. It would not be classified as a double whorl because it would be difficult to make a preferential choice between the two looping ridges.

## **Re: The Use of Various Chemical Blood Reagents to Develop Blood Fingerprint or Footwear Impressions. J. For. Ident. 2014, 64 (1), 43-70.**

**Author(s):** Pereira, P.

**Type:** Correction

**Published:** 2014, Volume 64, Issue 3, Page 209

**Abstract:** The editor is retracting this article because of serious technical errors in the article that could mislead the reader. Some of the background information is faulty and there are concerns about some of the research information and results. The information and data should not be relied on or cited in future research. Although the article was reviewed and prepared for publication, it is now obvious that the rigor of the editorial process in this instance failed to discover the concerns brought to the editor's attention immediately after publication. The article has been removed from the online IAI database of published materials and replaced with this notice. The author and editor apologize to the readers for these problems.

## **Re: Redundant Publishing of "Determining the Quality and Sustainability of Friction Ridge Deposits on Envelopes Sent Through the Postal System"**

**Author(s):** Holt, D.

**Type:** Letters

**Published:** 2014, Volume 64, Issue 3, Pages 210-211

## **Liquid Latex as a Cleanup Step to Visualize Bloody Shoeprint Evidence at Fire Scenes**

**Author(s):** Clutter, S.W.; Battiest, T.; McGill, D.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 3, Pages 212-222

**Abstract:** Arson is a frequently used method to conceal other violent crimes, but conviction rates for arsons are low because of fire's destructive nature, water suppression, and the assumption that forensic evidence has been destroyed.

This research was conducted to assess whether liquid latex is a suitable cleanup step to remove soot and debris from bloody shoeprints left on a variety of flooring substrates. Bloody imprints were placed onto eight common flooring surfaces, which were then exposed to heat and soot from burning furniture. The sooted shoeprints were photographed, and the surfaces were sprayed with liquid latex, allowed to dry, peeled, and re-photographed. The photographs were analyzed by a shoe examiner, who rated each pre- and post-latex-treated imprint for overall quality and ability to identify individual characteristics. The results showed that six of the eight flooring surfaces that were examined had higher quality ratings on the photographs taken post-latex versus pre-latex, suggesting that liquid latex is a reliable cleanup step to remove soot and debris that covers bloody transfer patterns.

## Clues in Friction Ridge Comparisons: Tonal Reversals

**Author(s):** Castellon, S.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 3, Pages 223-237

**Abstract:** In this study, tonally reversed prints were created, collected, examined, and compared to their known counterparts to document and observe any differences between the two images. Certain visual clues were observed: a dark background, the width of dark lines becoming thinner, split ridges appearing in what is assumed to be the ridges, the ridge count between ridges being off by one, the appearance of black dots in the light ridges, and creases appearing as darker areas. Not all of these clues were observed in every print, but each print contained at least three clues that indicated that the print, or a portion of the print, was tonally reversed. The observed clues appeared consistently enough to be confidently used as an aid when comparing friction ridge impressions.

## Nonporous Fluorescent Dye Stains: A Comparative Analysis

**Author(s):** Richards, D.A.; Thomas, J.R.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 3, Pages 239-254

**Abstract:** A comparative study was performed with the objective of determining whether Ardrox, MBD, and RAM fluorescent dye stains are equal to or better than the current fluorescent dye stains that are commonly used on fingerprint evidence: MRM-10, rhodamine 6G, and basic yellow. Seven different substrates were used for comparisons: glossy paper, plastic bags, aluminum cans, glass, metal gun magazines, unfinished wood, and finished wood. It was determined that numerous types of fluorescent dye stains are necessary in a forensic laboratory. The dye stains that performed better overall and received higher ratings were basic yellow 2-propanol, MRM-10, and MBD.

## Characterization of Latent Print "Lights-Out" Modes for Automated Fingerprint Identification Systems

**Author(s):** Meagher, S.; Dvornychenko, V.; Garris, M.

**Type:** Article

**Published:** 2014, Volume 64, Issue 3, Pages 255-284

**Abstract:** The term "lights-out" for automated fingerprint identification systems (AFIS) tenprint operations has been around for many years and is generally understood to mean "no human intervention is involved". But is this appropriate for AFIS latent print operations? Is it truly possible to conduct AFIS latent print searches without human intervention? The short answer is, not entirely, but the amount of human expert assistance can be greatly reduced. This paper introduces seven lights-out scenarios for supporting latent print examinations, defined herein as Tiers 1 through 7. Some of the salient pros and cons of each tier are briefly discussed. It is suggested that a more definitive analysis of the seven tiers requires a good cost-benefit model. These are not the only seven scenarios one could envision, and those presented could certainly be modified or even eliminated once a thorough examination is performed, but we propose these as a starting point for future discussion, exploration, and development. Part of the benefit of this discussion is to create a common understanding and standard terminology for the scenarios proposed and for future discussions.

## Backspatter Simulation: Comparison of a Basic Sponge and a Complex Model

**Author(s):** Rubio, A.; Esperanca, P.; Martrille, L.

**Type:** Article

**Published:** 2014, Volume 64, Issue 3, Pages 285-303

**Abstract:** To present a better understanding of the backspatter phenomenon, we conducted experiments using sponges and complex models. We were able to (1) demonstrate that a basic sponge is unsuitable for use as a reference material (as opposed to a complex model comprising a screen, blood container, skin substitute, and so on) and (2) present a better understanding of the phenomenon through the observation and definition of three distinctive kinds of backspatters.

## **Selected Characteristics of MP3 Files Re-encoded With Audio Editing Software**

**Author(s):** Koenig, B.E.; Lacey, D.S.; Reimond, C.E.

**Type:** Article

**Published:** 2014, Volume 64, Issue 3, Pages 304-321

**Abstract:** Detailed data analyses were conducted of the header metadata of 20 MP3-encoded files produced on 6 small digital audio recorders and then re-encoded with 4 commonly used audio editing programs. The purpose of this research was to identify specific changes made as a result of the re-encoding processes as they relate to forensic audio authenticity examinations. The re-encoding processes by the 4 audio editing programs always produced changes in the header sections that were different from the original recording format; additionally, 19 of the 80 re-encoded files had audio missing at the very end of the recorded data. The header format structure, the procedures followed, the numerous changes identified in the headers and the audio information of the re-encoded files, and a discussion of the authenticity implications are presented.

## **Back to Basics**

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2014, Volume 64, Issue 3, Page 328

**Abstract:** This pattern (Figure A) would be classified as a loop first and then referenced to a whorl. It fits the rules for reverse interpretation because the extra re-curves do not show up under a normal recording (Figure B). The print needed to be rolled beyond a normal width for the whorl to appear.

## **Articulating Aspects of Common Sense Explanation in Crime Scene Reconstruction: The Role of Spatial and Spatial-Temporal Constraint**

**Author(s):** Gardner, R. M.

**Type:** Commentary

**Published:** 2014, Volume 64, Issue 2, Pages 093-103

## **Case Study: The Enhancement, Comparison, and Matching of a Skin Texture Mark from the Back of a Hand**

**Author(s):** Harrison, A.; Smith, K.; Bleay, S. M.

**Type:** Case Report

**Published:** 2014, Volume 64, Issue 2, Pages 105-121

**Abstract:** This case study describes the enhancement and examination of a skin texture mark on one of a pair of gloves processed with vacuum metal deposition with the objective of determining who made the skin texture mark found on a glove left behind at a murder scene. The use of aluminum powder and a black gel lifter was tested and found to give the best reference prints. This case continues to support the sparse empirical evidence to support the use of skin textures as a means to associate a particular individual as having been in physical contact with a particular object or surface.

## The Physical Principles of the Reflected Ultraviolet Imaging Systems

**Author(s):** Cantú, A.

**Type:** Review Article

**Published:** 2014, Volume 64, Issue 2, Pages 123-141

**Abstract:** This work discusses two principles from optical physics that explain how and why using short wavelength ultraviolet radiation to illuminate and view smooth, nonporous surfaces reveals latent fingerprints on them. The first principle involves the reflectivity of the latent fingerprint residue, which is known to contain components that have high absorbance in the ultraviolet radiation region. As the wavelength of the illuminant decreases toward the ultraviolet region, the residue becomes more reflective due to it becoming less transparent. The second principle involves the fact that optical surface roughness (and therefore its ability to scatter) becomes more prevalent as the wavelength of the illuminating radiation decreases. For a surface to be considered optically rough, the average height of its irregularities must be greater than the wavelength of the radiation illuminating the surface divided by four times the cosine of the incident angle of illumination. Because the average height of latent fingerprint residue has been experimentally found to be about 250 nm, the roughness criterion predicts that it can be visualized best when the incident angle of short wavelength ultraviolet illumination is between 10 and 30 degrees, which agrees with what is experimentally observed.

## A Comparison on the Longevity of Submerged Marks in Field and Laboratory Conditions

**Author(s):** Sutton, R.; Greci, C.; Hrubesova, L.

**Type:** Article

**Published:** 2014, Volume 64, Issue 2, Pages 143-156

**Abstract:** This study compares (1) the rate of degradation of submerged fingermarks (latent fingerprints) in field and laboratory conditions and (2) several development methods. Sebaceous-rich and eccrine-rich marks were deposited on metal, plastic, and glass surfaces before being submerged in both laboratory and field conditions of sea, river, and lake water environments. Samples were removed at various time intervals of up to 14 weeks and were developed using one of three reagents: Oil Red O (solvent red 27), Sudan black (solvent black 3), and gentian violet (basic violet 3). The quality of the marks was assessed using a minutia counting method. Results showed that eccrine-rich marks did not survive even for short times whereas sebaceous-rich marks had extended survival. Marks that were submerged in field conditions survived longer than those that were submerged in laboratory conditions. The three visualization methods showed that gentian violet and Sudan black performed equally well in developing sebaceous secretions and were superior to Oil Red O at submersion intervals of longer than 10 days. Of the substrates that were tested, glass produced superior results, but all surfaces yielded high-quality marks during the times used in this investigation. It is recommended that future work use field conditions to examine longevity of submerged marks and that fingermark visualization should be attempted for submerged items even if they are recovered after some months of being underwater.

## Water-Soaked Porous Evidence: A Comparison of Processing Methods

**Author(s):** Simmons, R. K.; Deacon, P.; Farrugia, K. J.

**Type:** Article

**Published:** 2014, Volume 64, Issue 2, Pages 157-173

**Abstract:** This study compared the U.K. Home Office formulation for physical developer (PD) against Oil Red O (ORO) and a modified formulation of physical developer (MPD) that uses Tween 20 instead of Synperonic-N for enhancing fingermarks. Three different donors deposited fingermarks on porous surfaces (white paper, leaflets, and cardboard), with aging periods varying from 7 to 28 days. None of the techniques that were tested provided enhancement of latent fingermarks on leaflets, whereas poor-quality enhancement was observed on cardboard. In contrast, all techniques were more successful on white paper surfaces. The results obtained on white paper suggested that PD and MPD performed similarly, with PD detecting 82.3% of the deposited fingermarks and MPD detecting 86.5% of the deposited fingermarks. PD yielded a higher percentage (38.5%) of fingermarks with fine ridge detail (i.e., those with grade 2 or above) than MPD (35.4%). ORO, however, yielded poor results, enhancing only 4.5% of latent fingermarks, but showed no ridge detail in any of the enhancements (i.e., only showed grade 1 enhancements.)

## Guidelines for the Assessment of Fingermark Detection Techniques

**Author(s):** International Fingerprint Research Group (IFRG)

**Type:** Special Feature

**Published:** 2014, Volume 64, Issue 2, Pages 174-200

**Abstract:** The purpose of this document is to provide "best practice" guidelines for the evaluation of new or modified fingermark detection methods, from initial concept through to final casework implementation. These guidelines are not meant to be prescriptive; however, where research is conducted that is relevant to the scope of these guidelines, it is expected that significant deviations will be clearly indicated and justified in any associated presentations and publications.

This document has been prepared in consultation with members of the International Fingerprint Research Group (IFRG) and has been endorsed by the IFRG Steering Committee.

## Delayed Justice: Inside Stories from America's Best Cold Case Investigators

**Author(s):** Smith, M.

**Type:** Book Review

**Published:** 2014, Volume 64, Issue 2, Pages 201-202

**Abstract:** Reference: Branson, J.; Branson, M. Delayed Justice – Inside Stories from America's Best Cold Case Investigators. Prometheus Books: Amherst, N.Y., 2011; 301 pages. ISBN: 978-1-61614-393-0.

## Bone Remains - Cold Cases in Forensic Anthropology

**Author(s):** DesMarais, A. M.

**Type:** Book Review

**Published:** 2014, Volume 64, Issue 2, Pages 203-204

**Abstract:** Reference: Manhein, Mary H. Bone Remains – Cold Cases in Forensic Anthropology. Louisiana State University Press: Baton Rouge, USA, 2013; 123 pages. ISBN 978-0-8071-5323-9.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2014, Volume 64, Issue 2, Page 208

**Abstract:** This fingerprint is classified as a plain arch with no references. All ridges are following the same line of flow with the surrounding ridges. There is no up thrust, change of direction, or 45 degree angles. Several ridges are ending at about the same place in the center of the print.

## Scientific Validation of Friction Ridge Analysis: A Case for Empiricism

**Author(s):** Rimmasch, P.

**Type:** Commentary

**Published:** 2014, Volume 64, Issue 1, Pages 001-012

## Relaxation of Clenched Digits in Cadaveric Hands to Facilitate the Recovery of Postmortem Friction Ridge Impressions

**Author(s):** Siwek, D.; Reinecke, G.W.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 1, Pages 013-017

**Abstract:** This paper will demonstrate a simple technique for relaxing digits in cadaveric hands. An incision placed at the crease of the wrist to sever the flexor tendons allows for effortless access to the palmar surface of the hands in order to record postmortem fingerprint or palmprint impressions for identification purposes.

## Prediction of Stature from Hand Length and Foot Length

**Author(s):** Kuppast, N.; Iddalgave, S.; Suma, M.P.; Gupta, N.; Dileep, K.R.

**Type:** Technical Note

**Published:** 2014, Volume 64, Issue 1, Pages 018-027

**Abstract:** Identifying the remains of an unknown individual is an important part of forensic investigation, however, identification can become difficult when a complete body is not available. The present study was carried out to investigate the determination of an individual's stature using hand length and foot length. In this study, 100 students from the J. J. M. Medical College in Davangere, Karnataka, were randomly selected. The height of each student, the length of each hand (right and left), and the length of each foot (right and left) of each student were measured. These data were subjected to statistical analysis. Correlation coefficients were derived and regression equations were developed that led to the conclusion that hands and feet can be used in the population under study for the estimation of stature. In females, the hand length gave a better prediction of stature when compared to foot length.

## Analyses of Blue Gel Pen Inks Using Thin-Layer Chromatography and Visible Spectrophotometry

**Author(s):** Saini, K.; Kaur, H.; Gupta, M.

**Type:** Technical Note



**Published:** 2014, Volume 64, Issue 1, Pages 028-042

**Abstract:** The examination of gel pen inks and their differentiation is extremely important because these inks have gained tremendous popularity in recent years. In the present study, an attempt was made to differentiate 27 gel pen inks using thin-layer chromatography (TLC) and visible spectrophotometry. The inks were differentiated into nine groups using only visible spectrophotometry, but all inks were differentiated successfully by TLC using three different solvent systems. A statistical analysis was done for the TLC data using one-way ANOVA that concluded that the three solvent systems have discriminating power for the separation of the components of ink samples and that the discrimination power of the solvent systems was statistically significant. Therefore, thin-layer chromatography has proved to be a useful technique for differentiating gel pen inks and visible spectrophotometry is a complementary technique to TLC.

## The Use of Various Chemical Blood Reagents to Develop Blood Fingerprint or Footwear Impressions

**Author(s):** Pereira, P.

**Type:** Correction

**Published:** 2014, Volume 64, Issue 1, Page 043

**Abstract:** The editor is retracting this article because of serious technical errors in the article that could mislead the reader. Some of the background information is faulty and there are concerns about some of the research information and results. The information and data should not be relied on or cited in future research. Although the article was reviewed and prepared for publication, it is now obvious that the rigor of the editorial process in this instance failed to discover the concerns brought to the editor's attention immediately after publication. The article has been removed from the online IAI database of published materials and replaced with this notice. The author and editor apologize to the readers for these problems.

## Focus Stacking in Photoshop — Depth of Field Optimization in Macrophotography

**Author(s):** Dalrymple, B.E.; Smith, J.

**Type:** Article

**Published:** 2014, Volume 64, Issue 1, Pages 071-083

**Abstract:** Much of forensic photography involves close-up photography of impression evidence (e.g., fingerprints, footwear, tool marks) with minimal depth of field. This can be accomplished easily when the subject is on one flat plane, but the challenge increases when the subject occupies multiple planes (e.g., fingerprints on a curved surface, a bruise or tattoo that wraps around an arm or a leg). Focus stacking in Photoshop offers another option for extending the depth of field to record evidence on curved or irregular objects, while retaining sharp focus. This method may be completed with virtually any digital SLR camera, a macro lens, and a copystand.

## From Crime Scene to Courtroom

**Author(s):** Conner, H.

**Type:** Book Review

**Published:** 2014, Volume 64, Issue 1, Pages 084-086

**Abstract:** Reference: Wecht, C. H.; Kaufmann, D. From Crime Scene to Courtroom. Prometheus Books: Amherst, NY, 2011, 315 pages, ISBN: 978-1-61614-447-0.

## Back to Basics

**Author(s):** Siegel, S.

**Type:** Back to Basics

**Published:** 2014, Volume 64, Issue 1, Page 092

**Abstract:** These palms are interesting for several reasons: The top crease in the left hand runs straight across the palm. This is called a simian crease.