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PRESIDENTS MESSAGE

Dear Friends,

It is with sadness that I pass along information relating to the unexpected death of one of our members.

Michael J. Sweet of Edmonton, Alberta, Canada, passed away suddenly July 30th, 2006, at the age of 52 years. Michael suffered a brain aneurysm while at his residence. Michael was a 26 year veteran of the Edmonton Police Service where he spent several years within the Forensic Identification Section specializing in Bloodstain Pattern Analysis. In 1994 I had the opportunity to attend a training conference hosted by the Alberta Medical Examiner’s Office in Edmonton, Alberta, Canada. That was where Michael first introduced me to the discipline of Bloodstain Pattern Analysis. It was not difficult to realize that Michael held a strong passion for the discipline. Michael contributed greatly not only to the Edmonton Police Service and his community, but to our IABPA organization and helped further the discipline of Bloodstain Pattern Analysis. You may recall Michael’s recent article in the June 2006 publication of the IABPA NEWS. Michael J. Sweet was known and respected by many within our organization and he will be truly missed.

Our thoughts are with Michael’s loving wife (JoAnn), his family, and friends at this unfortunate time of loss.

For those wishing to pay their individual respect, Michael's address can be found in the current IABPA roster. In lieu of flowers, memorial donations can be made directly to the Multiple Sclerosis Society of Canada, Edmonton Chapter 11203-70 Street Edmonton, AB T5B-1T1.

I.A.B.P.A. NEWS 3 September 2006
The Use of Luminol to Detect Blood in Soil One Year after Deposition

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Introduction

The luminol reagent was first used in 1937 to detect latent bloodstains [1]. Since that time luminol has been commonly used by law enforcement agencies to detect latent blood at crime scenes. The luminol reagent reacts with latent blood by producing a blue colored chemiluminescence. In many cases this technique is used to detect blood that has been cleaned up by suspects. Some authors have reported the use of this reagent in detecting blood that has become latent through environmental degradation over time. Waldoch [2] reports on a case in which the luminol reagent was successfully used to detect blood from a parking lot area following a 72 day period since blood deposition. The author also reported obtaining positive phenolphthalein results on tested areas. Barber [3] reports that latent blood evidence was located in an open meadow 30 days following a double homicide using the product Starlight Bloodhound, a luminol derivative.

In the summer of 2004 one of the authors (Shimamoto) inquired of the senior author about the possibility of detecting blood with luminol from outdoor environments years after deposition. In order to test this question two outdoor blood lettings were selected from previously worked cases. The first case involved an adult male victim who had been shot in a vehicle then dumped in a parking lot approximately six months prior to testing. The second case involved an adult male victim who committed suicide by gunshot on a public golf course under a cement patio gazebo approximately two years prior to testing. Crime scene photographs of both incidents were obtained to identify areas to be tested. Luminol reagent was prepared for both testing sites using the following formula: .5g 5-amino-2,3-dihydro-1,4-phthalazinedione (luminol), 25g sodium carbonate, 3.5g sodium perborate, per 500ml distilled water. The luminol and sodium carbonate is combined in 250ml distilled water and the sodium perborate is mixed in the remaining 250ml of distilled water. Testing at the parking lot site yielded negative results. Testing at the golf course site initially yielded negative results. The gazebo area consisted of a cement pad with a roof surrounded by bare soil. Luminol was sprayed on the surface of the soil in the area of blood pooling identified by crime scene photographs. No chemiluminescence was seen on the surface of the soil. It was decided to scrape the top of the soil to a depth of approximately 1/8” and re-sprayed. The re-sprayed area showed chemiluminescence similar to the photographed areas of blood pooling. Samples of soil from the reaction area were also tested with phenolphthalein. The soil samples were “rubbed” onto a small sheet of filter paper to which the reagent was applied.

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Positive phenolphthalein results were obtained from several of the reaction areas identified with the luminol reagent. The soil surrounding the gazebo was also scraped and sprayed with no chemiluminescence detected. The presence of chemiluminescence in the area of known blood pooling, coupled with the negative results in areas not known to have been exposed to blood, supported the conclusion that luminol could effectively be used to detect blood in soil after extended periods of time. The observations were tentative, however, due to the unknown history of the testing area. It was decided to create an experiment to effectively test the detection of blood in soil with the luminol reagent while simultaneously controlling for false positive reactions.

Materials and Methods

A hilltop at the Highlands Ranch Law Enforcement Training Facility was selected as a testing site. The training facility is located in Douglas County Colorado approximately eleven miles south of the City and County of Denver. This area has been controlled by active law enforcement patrol since 1985. The hilltop is relatively flat with full sun exposure and limited ground vegetation. Six grid units measuring 24” x 24” were established on this hilltop. The grid units were designated #1 through #6 from North to South. Five hundred milliliters of horse blood were poured into each grid unit. The blood was poured in an “X” pattern to verify the authenticity of the blood reaction and help to identify any false positive reactions. Each arm of the “X” pattern was comprised of two hundred and fifty milliliters of blood. No attempt was made to level the soil surface or remove any of the weedy vegetation. Successful photographs of the reactions were obtained using digital cameras such as the Nikon D50, D100, D2H, Fuji Finepix S7000, and the Fuji Finepix S20pro. Acceptable exposures were from 10-30sec. at f3.5-f4.0. Attempts to document the reaction with a Sony “night shot” 8mm video camera were unsuccessful.

The blood was poured on October 5, 2004 (Figure 1). Within seven days the blood patterns were no longer visible on the soil to the naked eye. The experiment was designed to test ½ of the “X” pattern every two months in the selected grid unit in ascending order beginning with unit #1. Using this protocol the six grid units would allow for two years of testing. The second half of the grid unit was covered with thick black plastic sheeting for testing during the second, sixth, and tenth month testing cycles to protect the other half of the unit from overspray. Every four months the entire selected grid unit was sprayed (four, eight, and twelve months respectively). This allowed the authors to test the possibility of re-application of the luminol reagent after initial spraying. Figures 2-4 show the luminol reaction for grid units #1-#3 representing the four, eight, and twelve month intervals respectively. Reactions from the reagent applications were immediate and strong for all tested grid units. The soil surrounding each grid unit was also sprayed with no chemiluminescence detected. Unexpectedly, at the six month spraying, deer tracks traveling through the grid unit showed luminescence in several tracks up to eight feet away from the grid unit. The importance of this observation will be discussed in the conclusion of this paper. No other areas of chemiluminescence were observed outside the “X” patterns in the tested grid units at any time during this study.
Conclusions

The positive luminol reaction in the previously established “X” patterns demonstrates the effectiveness of this reagent in detecting blood in soil from outdoor environments. The chemiluminescence of the “X” pattern establishes three important conclusions. First, the poured blood pattern remained relatively unchanged over the course of one year. Second, pattern recognition of the “X” symbol established that the reagent was reacting entirely with the poured blood. Third, the reagent did not react with any soil components creating background “noise”. The reaction of the deer tracks at the sixth month mark of the study raise some interesting issues regarding crime scene reconstruction. The tracks were not present and did not react at either the four or eight month study dates. It is unknown how old the tracks were at the time of chemiluminescence, however, the reaction shows that individuals walking through a blood area may leave “artifact” shoe impressions many months after initial blood deposition. Investigators who obtain shoe impressions in the area of blood reaction should recognize the possibility that these impressions may have been created many months after the blood letting event and may not have any probative value to the investigation.
Weather and soil conditions certainly will have some effect on the longevity of blood reactions in outdoor environments. Accurate precipitation data was not available from this site and no model could be found to predict the possible effects that soil moisture, or aridity, PH levels, or micro-organism communities have on the longevity of reagent effectiveness. The Front Range of Colorado is a temperate environment with consistently low humidity. It is unknown what effect higher humidity and precipitation would have on the effectiveness of the luminol reagent over extended periods of time. This site did experience heavy snowfall and rain typical of the Denver Metro Area during the study period. This study has been designed to last two years. Future findings in this experiment will be reported following the conclusion of the study period in October of 2006. Other investigators are encouraged to conduct similar studies in their region to establish effective testing periods using the luminol reagent. Undoubtedly, blood volume, weather conditions, soil properties, and other post depositional processes will affect the success of these experiments.

References


Differentiating High Velocity Blood Spatter Patterns, Expirated Bloodstains, and Insect Activity

Kimberly Clark

Abstract

This project examines a difficult area in bloodstain pattern interpretation involving three visually and chemically similar stains: high velocity bloodstains due to injury, expirated bloodstains, and bloodstains caused by insect activity at the scene. Available literature was researched to determine whether each stain type had characteristics with sufficient uniqueness to allow differentiation. Articles and textbooks published in bloodstain pattern analysis and forensic entomology were utilized to determine the potential for individualizing these stains. The project was undertaken to collect relevant data and allow bloodstain pattern analysts confronted with stains consistent with high velocity to make the best possible classification, and further assist in crime scene reconstruction. By understanding the unique characteristics of each bloodstain pattern and the mechanism with which they are created, this project seeks to provide a focused collection of the research to date that has attempted to differentiate similar stains.

Introduction

Two common problems with bloodstain pattern analysis are the difficulty and ambiguity of determining how a stain was produced, and issues with proper categorization of stains for crime scene reconstruction purposes. These two issues work together during a bloodstain pattern analysis to generate an opinion of what caused a specific type of stain pattern.

Determining the mechanism of a stain has been an issue since the onset of bloodstain pattern analysis as a discipline in forensic science. The early research conducted in bloodstain analysis used the average measurement of bloodstains to determine the level of force required to produce that type of pattern (MacDonell, 1971). By measuring the stains, three categories of velocity were created: low, medium, and high. Each category had a range of stain sizes that the measurements fell within, attempting to generate a scientific method of determining impact energies of specific patterns. For low velocity stains such as pools and flows, this categorization has not seemed to be an issue. The same applies to extremely high velocity stains such as high-powered rifles or explosives that cause a “misting effect.” The problem area lies between the two extremes. Medium velocity stains and high velocity stains often overlap if based solely on droplet size averages. A beating incident, for example, may cause slightly smaller stains and could be confused with an injury caused by a lower velocity gunshot. In this scenario, the stain patterns no longer can be accurately categorized by their size alone. This presents a gray area in determining the mechanism of a stain and making judgments as to the force-generating action that resulted in the particular stain. This ambiguous area allows for a great deal of misinterpretation of stains, as well as disagreement among opinions as to the etiology of a stain pattern at a crime scene.

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This has sparked a movement within the bloodstain analyst community to attempt other, more descriptive, methods of categorizing bloodstains; currently however, both methods are still in use, and ambiguous terminology often creates problems in reconstruction.

Objectives of the and Rationale of the Study

The intended goal of this project is to clarify the descriptions, mechanisms, and interpretation of three types of stains; those categorized as high velocity, expired stains, and stains produced by insect activity at the scene that create similar patterns. By understanding the nature of blood, fluid dynamics that explain its motion, bloodstain patterns representing these three types of stains can be compared and contrasted to better recognize the subtle differences that may exist. This article will examine the current literature and research that has been conducted to attempt to differentiate these types of stains and what examinations may provide enough detail to correctly classify them.

High velocity, expired, and insect stains were chosen due to their high degree of similarity in size that may result in classifying the patterns incorrectly. An example of the tendency to group these stains together can be noted in an article published in the FBI Law Enforcement Bulletin, which lists high velocity stain patterns as being created by “gunshots or explosives…industrial machinery or even expired air, such as coughing or sneezing” (Akin, 2005, pp. 22). Several texts state that there are differences between these three patterns, but fail to go into sufficient detail to provide a basis for making a correct determination of the origin. Discovering the intricacies and characteristics inherent in each bloodstain type will allow for proper classification and as a result, more accurate crime scene reconstructions.

The three types of stain patterns examined exhibit similar physical characteristics. Research into each type may provide methods to help identify each stain pattern. By providing clearer characteristics or methods of differentiation, there exists a higher potential for correct classification, and thus higher confidence in bloodstain pattern analysis as a valid part of crime scene reconstruction.

Bloodstain Pattern Categorization

Some of the most subjective areas of bloodstain pattern analysis are the categorization of bloodstains. Some texts use the original mechanism, while others use a more descriptive method. Determining what constitutes “velocity” in reference to a blood spatter pattern was originally suggested in the 1971 research by Herbert MacDonell. Stains sizes are measured, and the resulting average of their diameters then categorizes a stain as low, medium, or high velocity. Stains with spatter averaging less than an eighth of an inch constitute medium-high velocity, with droplets getting smaller with the increase in the impact force. At the higher end of this spectrum, extremely high velocity injuries can cause droplets small enough to cause a misting effect. Several issues with this method of categorization have caused many modern analysts to override this mechanism determination in favor of a more descriptive method.

The descriptive method refers to a more visually based approach in classifying bloodstains. There are three main groups in this method: passive, spattered, and altered stains. Passive stains include any pattern that has been created by gravity alone, and not a significant external energy. These include drops and drip trails, pools of blood, saturation stains, splashes, and flow patterns.
This group also includes contact or transfer stains from a bloody object touching a surface that was not previously bloody, such as smears, swipes, or transfer impressions of specific objects. The second group of stains includes spatter patterns. These are patterns created by an external force, and can vary a great deal in size. Spatter patterns are generated either by an impact, a secondary source, or by projection.

The final group of bloodstains is referred to as altered. These are patterns that have changed either physiologically or physically. These include changes over time, such as clotting or drying; physical changes when the pattern was created, including pattern voids; and postmortem effects like insect activity (Figure 1).

*Figure 1. Bloodstain categorization (James, Kish, & Sutton, 2005, pp. 69).*
High Velocity Blood Spatter

In 1971 Herbert MacDonell and Lorraine Bialousz published *Flight Characteristics and Stain Patterns of Human Blood* with support from the National Institute of Law Enforcement and Criminal Justice. One of the primary sections included determinations of velocity. The research conducted suggested two categories of bloodstain velocity: medium velocity and high velocity. According to MacDonell and Bialousz, medium velocity included blows from objects such as clubs or hammers. Medium velocity spatters result when the impacting force is between 5 and 25 feet per second. The high velocity stains included those caused by gunshot, and produce a fine mist of blood. From the structured experiments with mechanized devices, the conclusion was that speeds of 25 feet per second and over produce these high velocity stains.

Another method of determining velocity is based on droplet size, in addition to the feet per second calculation. Low velocity stains in this category include those with spots at least four millimeters in diameter and are caused by forces of 5 feet per second or slower, generally gravitational forces acting alone on a bloodstain. This same method lists medium velocity as stains between one and four millimeters in diameter and speeds between 5 and 25 feet per second. High velocity includes stains of less than one millimeter stains and over 100 feet per second speeds (Bevel & Gardner, 2002). Bunker (2002) also uses these speeds, but does not include the average stain size as part of the equation in determining velocity of spatter.

Spatter patterns are often confused, due to the variations in definition as well as the gaps in certain classification methods (Wonder, 2001). Stains with estimated force velocity of between 25 and 100 feet per second create a large area of ambiguity, demonstrating the difficulty in assigning a standard term to the spatter pattern. This has been an internal issue within the bloodstain pattern analysis community for many years.

Due to this ambiguity, the use of a descriptive or visual component has been used to provide a possible means of clarifying the etiology of a particular stain pattern. James *et. al.* (2005), using this more visual scheme, categorized spatter patterns in Figure 2.

![Figure 2. Spatter Taxonomy (James, Kish & Sutton, 2005, pp. 108).](image-url)
High velocity blood spatter patterns in this descriptive categorization fall under the impact mechanism category. Because of the wide range of possible velocities, there can be no clear delineations between a stain that constitutes “medium” versus a stain that constitutes “high” velocity (Figure 3). A vigorous beating can cause a very similar pattern to a low speed gunshot, and with the ambiguity between using droplet diameters and/or feet per second calculations, this method attempts to use a systematic approach to determining the causative mechanism of a spatter pattern.

Under this type of categorization, a stain is first classified as spatter, then as secondary, impact, or projected and finally, individualized if possible to a specific force. In most cases, the surrounding crime scene, medical examiner’s reports, and locations of spatter can help narrow down the possible causes and allow increasing levels of specificity. Wonder (2001) discusses a similar method using the physical evidence labels of class characteristics and individualizing characteristics to narrow down the possible origins of a particular stain pattern.

Figure 3. Comparison of size range of spatter produced by left to right- gunshot, expiration and beating.
Impact Spatter from Injuries

Studies on medium or high velocity spatter patterns generally focus on reconstruction of spatter. High velocity spatter from injuries has been simulated using animal or inanimate blood-filled objects to reconstruct spatter.

Gunshot spatter patterns are not predictable. Limitless factors can cause changes in the possible spatter distribution, including positioning of the body, distance, ammunition size and type, presence of clothing, and the location of the wound. The ability of backspatter to identify perpetrators or witnesses of a crime has prompted several studies focusing on backspatter to determine the amount and distribution patterns possible. In 1987, Pex and Vaughan published a study in the Journal of Forensic Sciences, evaluating spatter produced from gunshot wounds. They state that in observed case studies, injuries in areas with exposed skin produce more backspatter than those with intermediate surfaces such as hair or fabric. They simulated gunshot wounds with blood soaked sponges and a rim fire revolver. They tested contact, close range in one foot increments from the target, both exposed and cloth covered. The shooter wore a long sleeved shirt and white lab coat to allow maximum observation of backspatter patterns. The team noted that cloth covered targets resulted in a decreased amount of blood projected back from the wound. They tested different muzzle angles, observing that a downward shot could potentially direct more backspatter to the underside of the shooter’s arm. To complete the study, the team also made attempts to duplicate backspatter patterns using transfer with bloody objects, observing that the amount of saturation into the weave of the fabric allowed discrimination between backspatter and transfer patterns.

Karger, Nüsse, Schroeder, Wüstenbecker, and Brinkmann published a study in 1996 on experimental backspatter. The team selected nine bovine subjects destined for slaughter, and two kinds of ammunition for testing. The animals were shot at three distances; tight contact, 5 centimeters, and 10 centimeters. The resultant backspatter was captured on white paper placed below the targets. The team noted that backspatter was present after every shot, and primarily in aerosol-type spray or stains of 0.5 millimeters diameter. They noted that the distribution ranged from 0 to 119 centimeters from the entry wound, but that there was no constant or regular pattern produced. The type of ammunition did not appear to affect the distribution pattern, though tight contact showed the furthest distance reached by individual droplets. Due to the small number of subjects, they did not conduct a statistical analysis.

These two studies provide some insight into the existence of backspatter and its ability to link a surface or suspect to a crime. In any projectile type injury, the potential exists for both the creation of forward and backspatter as part of the high velocity pattern to be observed at the scene.

As previously discussed, true high velocity stains from impact injuries can be influenced by a multitude of factors. The level of clothing or other barriers between the weapon and the site of impact; the caliber of a firearm; distance from the site of impact; position, angle, and the number of shots fired; or time in contact with a moving object. Each factor can highly alter the level of blood generated and the distribution of the resulting bloodstain. Impacts from gunshot injuries are the most common type seen in case studies, and can result in extremely fine stains; often small enough that the pattern is referred to as a misting or aerosol pattern (James, Kish, & Sutton, 2005). This pattern has also been described as similar to spray paint (Bevel & Gardner, 2002). The stain will depend on the distance crossed by the individual blood droplets. Based on
the effects of gravity and wind resistance, the smaller the drops are, the shorter the distance they will travel. Larger drops will be able to overcome these forces longer, and will travel further from the site of impact. As a result, stains located close to the site of a gunshot injury may show a large distribution of stain patterns, ranging from small individual drops to areas of misting. Gunshot powder and residue may be present on surfaces at close distances. If both forward and back spatter occur with a gunshot injury, forward spatter is generally more symmetrical than back spatter. Back spatter is generally limited to within four feet of the site of impact (Bevel & Gardner, 2002).

Smaller drops in a gunshot injury are often 0.2 mm or smaller, according to Laber and Epstein (as cited in Bevel & Gardner, 2002). Stains larger than this size begin to overlap with stains from other impact types. Gunshot wounds can therefore generate a wide range of stain sizes based on the variables unique to the specific crime scene.

As noted by Wonder, students in bloodstain pattern classes have often been able to correctly identify high velocity stains from gunfire before being trained (2001). The two points that appeared to allow this identification included the misting/atomization type pattern in conjunction with a distinct point of convergence for each projectile. Based on the location, the bullet may leave a visible hole, assisting in preliminary identification as high velocity spatter. However, a caveat reminds bloodstain pattern analysts to remain open minded and observant when processing a scene, never making assumptions. The reminder states, “Remember, anyone can expire blood from their mouth onto a wall that could also have a bullet hole in it” (MacDonell, 2004, pp.15).

From this data, the hypothesis was supported, though most authors warned that an unbiased, objective point of view should be maintained, due to the multiple mechanisms possible in high speed velocity patterns. The common denominator(s) in these types of patterns was directionality pointing to a common source, and the appearance of misting or aerosol stains as being characteristic of gunshot generated stain patterns.

Beatings and stabbings have often been seen to create bloodstain patterns that can be similar to those of gunshot related injuries. Both blunt objects such as clubs, hammers, or even fists, as well as sharp objects including knives and axes can produce spatter patterns with droplets small enough to be considered high velocity. Spatter patterns in these types of injuries are generally due to the weapon impacting a bloody source. Thus, single blows are usually not capable of producing spatter that can be confused with high velocity spatter patterns. James, Kish, and Sutton (2005) produced experimental patterns of beatings with various volumes of blood. They note that some patterns of this type can resemble high velocity-type stains, and that the amount or size of spatter can vary a great deal between cases.

**Expirated Blood**

Expirated bloodstains include those stains caused by blood being forced out of the nose and/or mouth due to injury that causes blood to enter the respiratory tract. This type of pattern may also result from a victim with their face in a pool of blood while continuing to breathe (MacDonell, 1996). Expirated stains fall into the category of projected stains.

Expirated bloodstains can have several origins, the common element being entry of blood into the respiratory system. Injuries from broken ribs, flail chest, lung penetration or injuries to the mouth or nose can cause blood to be mixed with respiratory air (James, 1999). Once introduced,
any mechanism that would propel air from the mouth or nose can subsequently project blood onto a surface. This includes actions such as coughing, sneezing, wheezing, spitting, or as an artifact of resuscitation procedures by paramedics (James, Kish, & Sutton, 2005). Based on the amount of blood introduced to the respiratory system, the size of the spatter as well as the individual component droplets can range greatly. The characteristics of the spatter pattern are also affected by the amount of exhalation force.

Expirated stains from respiratory activity are described in most bloodstain pattern analysis textbooks, and more specifically in an article by Emes (2001). Following experimental expiration and case study observations, Emes noted that expired blood does have specific characteristics. Due to its possible mixture with mucus or saliva, the stain may appear diluted. This dilution may cause expirated stains to appear in less vivid color than other stains (Bevel & Gardner, 2002). If higher levels of saliva or mucus are present, the stains may bead, and be connected by small strings of mucus containing fluid. Expirated stains may contain bubble rings from air mixed with the blood as it is expelled. This is observed in case studies, noting that the presence of air bubbles are conclusive for expired blood and will not be found in normal bloodstains (MacDonell, 1996b; James, 1999). Blood patterns created through expiration may also be bilateral, if due to a sneezing mechanism.

One of the best ways noted by most textbooks and articles to support or exclude a stain pattern as being expired is correlation with the injuries of the victim at the scene. Once a pattern has been located that appears to be expired blood, confirmation with the medical examiner of blood in the nose or mouth, or other respiratory injuries possible of generating such a stain will support expiration as a possible mechanism. Based on this research, this hypothesis was supported. There are characteristics of expirated blood that allow it to be identified. Characteristic air bubbles or dried bubble rings in a stain, correlating respiratory injury, and the presence of high levels of amylase activity, along with possible mucus strands, beading or dilution, can classify a stain as being an expirated bloodstain pattern.

Expirated blood is primarily discussed in terms of observation of naturally created expirated stains, since reconstruction of authentic expirated blood spatter in a research setting would require injury to the respiratory tract. A 2001 study done by Emes reviewed expired bloodstain patterns and attempted recreation of these types of stains. Emes placed 20mL of blood into his mouth, then coughed and sneezed the blood onto white paper in an attempt to create expiration patterns. This study references a 1996 Forensic Science Service report of Graham Carter conducting similar experiments. Carter placed 5mL of blood in his mouth and tested two types of stains; coughed from the back of the mouth, and spat from the front of the mouth. This article was the only mention of experimental study that was located during the research for this project.

Insect Artifacts

The earliest reference located regarding insect stains being similar to bloodstains was a 1907 paper by W.D. Sutherland. The work noted that small stains are created by fleas, and that should a few drops of blood be found on a suspect, the defense may allege that these are insect stains (MacDonell, 1992). Insect artifacts or fly specks are a result of insect activity after blood has been exposed to the environment (Bevel & Gardner, 2002). Usually caused by flies, insect patterns result from insects walking through blood and leaving tracks on other surfaces. They can also result from flies regurgitating or excreting small amounts of blood. Regurgitation spots are
also known as flyspeck blood spatter due to flies being the most common generator of insect activity patterns (Wonder, 2001). Some flies will be attracted to blood not as food, but as medium for laying eggs, even in blood alone, without a body present (Erzinçlioğlu, 2000). Insect artifacts have also been caused by cockroaches leaving patterns after walking through drops or pools of blood, noted by Haglund & Sorg in *Forensic Taphonomy: The Postmortem Fate of Human Remains* (as cited in James, Kish, & Sutton, 2005). Insects can continue creating additional spatter appearing patterns as long as they have access to the liquid blood at the scene. Because insect artifacts are created after the original bloodstain patterns have been deposited, insect stains are considered altered stains, as seen in figure 4. These are stains that are created due to physical or physiological alteration of a stain. This includes active interruptions such as wipes and swipes, as well as time related natural changes in blood characteristics; serum separation, clotting, and drying.

The characteristics of insect generated bloodstains were most succinctly described by Benecke and Barksdale. In 2003, the two authors published a study focusing on fly patterns and how to distinguish them from bloodstains. They provided three case examples where bloodstain patterns were located and determined to have been caused by flies at the crime scene. Measurements were taken of stains to later compare to laboratory data. A laboratory experiment was run, providing a reddish-brown food source to adult *Calliphora vicina* blowflies. They were allowed one day in a breeding cage with the food source to provide time for the flies to track and regurgitate the substance on the surfaces of the cage and determine whether the shapes of the stains could be matched with those found at the crime scenes. This article was the single resource located during this project that included a laboratory experiment to determine the types of patterns that insects leave on a surface.

![Figure 4. Spatter size stains on denim produced as the result of fly activity.](image-url)
All three types of medium-high velocity type bloodstain patterns can exist in a single scene. Proper interpretation of the spatter patterns is crucial to reconstructing the events and providing the most accurate analysis possible. Differentiating true medium-high velocity stains resulting from injury, expired patterns from coughing or sneezing, and insect artifact patterns is an important step in any crime scene that appears to contain patterns with small stains.

A commentary on Beneke and Barksdale’s article also mentions insect patterns that have been generated by cockroaches tracking through blood at a crime scene (Ristenbatt, Pizzola, Shaler, & Sorkin, 2004). Both references to case studies regarding this particular insect are listed as papers presented at past conferences, but copies were unavailable during this research project.

In one forensic entomology text, Entomology and the Law, fly specks, though mentioned outside the context of blood specifically, note that there are three types of fly spots: fecal deposits, which are often round and opaque; vomit stains that are opaque in the center and more transparent around the edges; and proboscis marks. The authors state that these proboscis marks can be left on partially dried material (Greenberg & Kunich, 2002).

Based on this information, it was confirmed that there are characteristics inherent to insect stains that can assist in their identification. Specific shapes and lack of directionality, in conjunction with possible locations unlikely to be a result of impact, can provide a bloodstain pattern analyst with enough detail to confirm the mechanism of the stain pattern.

Conclusions

This research provided an educational view of one of the issues associated with bloodstain pattern analysis. The forces that act upon blood, whether in the context of violent bloodshed or accidental injury, have the potential to create a variety of bloodstain patterns. Multiple factors must be taken into consideration to develop the best possible scenario for the reconstruction of the events; the environment, the location of the injuries, the position of the victim and assailant, the amount of force causing an impact injury, and many other less obvious aspects that may be unique to a particular crime scene. A great deal of knowledge is required to reconstruct a bloodshed incident and provide an analyst with the necessary tools to interpret existing stain patterns. This knowledge also supports a bloodstain analyst in attempting to understand unusual stain patterns by using laboratory experiments to reconstruct possible origins. Each piece of the puzzle provides its own portion of the knowledge required to fully understand and reconstruct an incident. Blood, and all of its functions and characteristics, imparts knowledge of several aspects of understanding bloodstains. The clotting process, how injuries affect blood, blood pressure, some medications and the basics of blood related diseases and how they may affect blood flow all factor in bloodshed and aid the analyst in estimating reconstruction of a crime scene. Fluid dynamics adds the concept of force, and what amounts are necessary to generate specific patterns. It also adds understanding of gravity, surface tension, and how blood acts as a droplet, both in flight and upon landing.

The basics of bloodstain pattern analysis use these two fundamental areas as a framework to explain how the stain patterns left by blood in a violent encounter may have been generated, and how to interpret the bloodstains and piece together the possible steps in a crime scene reconstruction. Bloodstain classification into groups of stains further individualizes a stain pattern into a passive, spatter, or altered stain pattern. The next tier allows an even narrower focus into more mechanism based categories; including projection, impact, flows, pools, and
transfer stains. It is in this area that the bloodstain analyst has the best chance of determining the most likely chain of events and reconstructing the crime to aid in the investigation. In the case of those stains consistent with high velocity, the information researched in this project can provide a basis for classifying the stain pattern with more certainty as to its origin. Ruling out stains due to certain elements being present or absent, a more likely conclusion can be drawn, and a more accurate crime scene reconstruction can be created. This pulls together the most important factor learned in this research; the element of context. Corroboration with medical notes and autopsy reports, crime scene evidence, and specific characteristics of the existing bloodstains can produce a high quality bloodstain pattern analysis.

Recommendations

Bloodstain pattern analysis has additional research that can be done to further classify and understand various patterns. In researching bloodstain pattern mechanisms, forensic entomology, and the areas where they overlap, experimentation can be applied. Several possible steps could be taken in further research.

Another area highlighted by research into bloodstain pattern analysis is the current lack of standardized training and certification. Though the IABPA does require a minimum level of hands-on training to become a full member, no certification or annual testing exists to ensure that those consultants testifying in court have the necessary experience or training to offer expert opinions. Instituting a certification process by a professional institution may add another level of recognition that an expert has been properly trained. Bloodstain pattern analysis is a newer specialty in forensics, having not been a large focus until the last 50 years. Increasing the standardization of training and implementing certifications can further support the field and increase the level of professionalism.

Bloodstain experts are frequently consulted for cases through the use of photography and case reports, without access to the scene during its primary investigative state. It may be a benefit to both the consultants and law enforcement to develop photography requirements for processing scenes with extensive bloodstains or high velocity spatter patterns. If a consultant must form an opinion based on still images, this may allow a more accurate and standardized manner of studying the blood evidence of a scene from a distance. Another possibility exists in using standardized forms to submit a case to a certified bloodstain analyst for review. Over time, experts will be able to compare various cases and the patterns they have encountered, based on similar methodology of reporting and photography, allowing for more precision in generating opinions and crime scene reconstructions.

A last possibility for further development is a concept of a central registry of high velocity case studies. In the research conducted, high velocity stain patterns appeared to be the most complicated stain pattern to interpret, allowing for multiple theories as to the mechanism that created the stain. A possible method for both research and training may be a registry that contains the standardized forms and photographs from high velocity cases. Whether electronic or paper based in nature, this could allow a central depository of information for research and educational purposes.
References


For further information contact Kimberly Clark at kimberlyclark@infinitics.com


The Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN) was formed in 2002 to assemble bloodstain pattern practitioners, and practitioners from related fields, to share, discuss, and evaluate methods, techniques, protocols, quality assurance, education, and research relating to bloodstain pattern analysis (BPA). To this end, the mission of SWGSTAIN is to promote and enhance the development of quality forensic BPA practices through the collaborative efforts of government forensic laboratories, law enforcement agencies, private industry, and academia. This forum addresses substantive and operational issues within the field of BPA and works to build consensus-based, or so-called, “best practice,” guidelines for the enhancement of BPA. The current chairperson of SWGSTAIN is Anthony J. Onorato of the FBI Laboratory. The SWGSTAIN Vice Chair is Tom Griffin of the Colorado Bureau of Investigation. SWGSTAIN’s Executive Board includes Anthony J. Onorato, Tom Griffin, Tom Bevel, Martin Eversdijk, Pat Laturnus, Kelly Robbins, and Paul Kish. Jim Mudd of the FBI Laboratory serves as the SWGSTAIN Executive Secretary. The American Society of Crime Laboratory Directors-Laboratory Accreditation Board (ASCLD-LAB) representative from Mike Van Stratton of the Kansas Bureau of Investigation.

To fulfill its mission, SWGSTAIN has formed four (4) subcommittees that concentrate on different substantive areas of BPA. The first is the Taxonomy and Terminology Subcommittee which has been tasked to develop a comprehensive classification system for the organization of recognized bloodstain pattern types and a companion lexicon for use in describing these patterns. The chair of this subcommittee is Ross Gardner of Gardner Forensic Consulting. Other members of this subcommittee include Kelly Robbins of the WKCAC; Paulette Sutton of the University of Tennessee’s Regional Forensic Center; Stuart James of James & Associates Forensic Consultants; Robert Spalding of Spalding Forensics (retired FBI); and Victor Gorman of the Royal Canadian Mounted Police.

The second subcommittee is the Training and Education Subcommittee. The members of this subcommittee have been tasked with developing guidelines for the basic educational and training requirements for practicing bloodstain pattern analysts and the basic content of specialized training courses in BPA. The training and Education Subcommittee is chaired by Heather Seubert of the FBI Laboratory. The remaining members of this group include Kenneth Martin of I.A.B.P.A. News

The third is the Quality Assurance Subcommittee which is developing guidelines for a comprehensive quality assurance program and its component parts (i.e., standard operating procedures (SOPs, etc.) for BPA that mirrors those developed by other recognized forensic disciplines. This subcommittee is chaired by Lee Ann Singley of Grayson Singley Associates, LLC. The other subcommittee members include Tom Bevel of TBI, a private consulting firm, Michael Illes of the Ontario Provincial Police, Martin Eversdijk of the Institute for Criminal Investigation and Crime Scene in The Netherlands, and Neil Fraser of the Royal Canadian Mounted Police.

The last subcommittee is the Legal Subcommittee which has been tasked to assemble and/or develop the scientific materials necessary to support the acceptance of BPA in courts of law at both the admissibility and trial levels. This subcommittee is chaired by Rhonda Craig of the FBI Laboratory. The other subcommittee members include Jeff Gurvis of Porter Lee Corporation, Phyllis Rollan of the Alabama Department of Forensic Science, Jon Nordby of Final Analysis Forensics, Rosalyn Hammond of Forensic Alliance Limited, and Terry Laber of the Minnesota Department of Public Safety’s Bureau of Criminal Apprehension.

The most recent SWGSTAIN meeting was held in Fredricksburg, VA from April 3-7, 2006. Highlights from this meeting included presentations and group discussions of the ASCLD-LAB Proficiency Review Program with Mr. Dean Gialamas, Director of the Forensic Sciences Service Division of the Orange County Sheriff’s Department and funded research opportunities with David Baldwin of the Midwest Forensic Resource Center at Iowa State University. Additional presentations and group discussions were conducted with Philippe Esperança of French Gendarmerie Forensic Research Institute; Michael Taylor of the Institute of Environmental Science and Research, Auckland, New Zealand; and S/Sgt Jon Forsythe of the Royal Canadian Mounted Police (RCMP).

The subcommittee activities at this meeting included a presentation made by the Taxonomy and Terminology Subcommittee to the general membership (as a part of SWGSTAIN’s internal peer review process) of a document defining the various taxonomically defined bloodstain pattern types. Based on this discussion, the Taxonomy and Terminology Subcommittee will be offering its proposed taxonomy document for final group review at its Fall 2006 meeting. Upon completion of this taxonomy, this Subcommittee will complete its work on the accompanying draft terminology lexicon. The Legal Subcommittee, having finalized its draft document of suggested predicate questions for public peer review (which is available for public review at SWGSTAIN.org), is currently developing a guidance document for conducting validation studies of new BPA techniques. The Training and Education Subcommittee finalized its work on guidelines for the minimal educational requirements for bloodstain pattern analysts. This document is soon to be voted upon by SWGSTAIN for release for public peer review. The Quality Assurance Subcommittee, having finalized its draft document for the development of a quality assurance program in BPA for public review (which is available for public review at SWGSTAIN.org), is currently developing a guidance document for establishing guidelines for the content of standard operating procedures (SOPs) in BPA. SWGSTAIN also extended membership to three (3) individuals: Iris Dalley of the Oklahoma State Bureau of Investigation, Jon Forsythe of the RCMP, and Michael Taylor of the Institute of Environmental Science and
Research in Auckland, New Zealand. With these additions, together with the acceptance of Mark Reynolds of the West Australian Police Service at its Fall 2005 meeting, SWGSTAIN has expanded its membership roster to include twenty-five (25) different law enforcement and BPA consulting entities across North America, Europe, New Zealand, and Australia.

Additionally, at this meeting SWGSTAIN discussed the status of its website: SWGSTAIN.org. This website is being developed by SWGSTAIN principally to facilitate its communication across members as they work on their various subcommittee tasks outside of SWGSTAIN’s bi-annual meetings. While SWGSTAIN.org is still under development, it is currently operational and serving one of its important secondary functions: that is, a real-time source of information for the BPA community concerning the activities of SWGSTAIN. A major consideration in the design of SWGSTAIN.org (which as has been previously captured in its business rules) has been SWGSTAIN’s acute awareness of the necessity of including the BPA community in its ultimate goal of formulating consensus-based, best-practice, guidelines for the enhancement of the discipline of BPA. Without mechanisms to include as many BPA professionals as possible in the development process, SWGSTAIN recognizes that any guidance document or other work product it provides may not incorporate the strengths, nor address the weaknesses, inherent to a professional community with such a broad spectrum of practitioners. Unfortunately it is simply not feasible to expand the SWGSTAIN membership to the size necessary to permanently represent this entire spectrum. However, SWSTAIN has made it a priority to infuse new ideas and perspectives into its deliberative process through its invitation of guests to address and participate in its meetings, its establishment of *ex officio* memberships for the International Association of Bloodstain Pattern Analysts (IABPA), the International Association for Identification (IAI), and the Association for Crime Scene Reconstruction (ASCR), and its regular updates at various meetings of the BPA community.

While these strategies have proven invaluable to SWGSTAIN, it is through its public peer review requirements that SWGSTAIN anticipates the most direct and substantive interactions with the BPA community. In an effort to make this critically important process as efficient as possible, SWGSTAIN will utilize SWGSTAIN.org to distribute those draft documents ready for public comment, collect any comments reviewers may have concerning them, and formally respond to the constructive feedback provided. With respect to the review process itself, you as our colleagues should view SWGSTAIN draft documents as proposed general guidance information intended for use by both the BPA community and those who routinely consume BPA information such as law enforcement and the criminal justice system. As such, it is the intent of these documents, once finalized, to describe the policies, procedures, and/or practices that best assure the quality of the BPA information provided by its practitioners.

It is the belief of SWGSTAIN that no group is better positioned and/or informed to establish such best-practice guidelines than the BPA community itself. In fact, during its work to date, it has been SWGSTAIN’s experience that the BPA community is already operating either to the letter or in the spirit of many of the best-practice parameters contained in its draft documents to date. These draft documents, then, when combined with the BPA community’s peer review input, can yield consensus, best-practice guidelines that serve as the benchmarks against which individuals and/or agencies performing BPA may compare themselves. Holding ourselves to such internally developed expectations will demonstrate to those to whom we provide our services the reliability of BPA, as well as its individual practitioners. Further, it can only help to raise the quality of BPA work being conducted. For those SWGSTAIN documents available for
public comment, please go to the home page(s) for the individual SWGSTAIN Subcommittees: Taxonomy & Terminology, Quality Assurance, Legal, and Training and Education at SWGSTAIN.org.

The next regular meeting of SWGSTAIN is tentatively scheduled for November 6-10, 2006; however, its location has yet to be chosen.

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CASE REPORT

Bloodstain Pattern Interpretation: A Case Study

Stephen Gutowski¹, Rebecca Heyes², Stephen Lake¹ and Margaret Schulz³.

A recent Victorian case involved serious injury to one person and a fatal arrow wound to a second. Initially the wounded person claimed self defence in response to an attack by the deceased with a kitchen knife and no witnesses came forward to corroborate or deny his account. The pattern of blood staining at the scene both in the house and the back garden suggested that the deceased was prone when shot, that the knife wound to the suspect may have been administered well away from where the deceased was found and that the position of the knife in the deceased’s hand may have been staged. DNA testing of samples from the various areas of bloodstain patterning supported these hypotheses and the wounded man was charged with murder. After the suspect was jailed, other persons visiting the house at the time of the incident came forward to corroborate the scientific findings. The case demonstrates the value of bloodstain pattern interpretation and DNA typing combined with good crime scene examination and detective work.

¹(Crime Scene Division, Victoria Police Forensic Services Department, Macleod VIC Australia, Biology Division, Victoria Police Forensic Services Department, Macleod VIC Australia², Homicide Squad, Victoria Police Crime Department, Melbourne VIC, Australia³)
Herb MacDonell, Program Chairman for our Annual Meeting, says that during past IABPA meetings it has been difficult, if not impossible, to enjoy whatever local attractions were available in any particular host city. The program schedule rarely allowed taking in the wonders of the local area, whatever they might have been.

Therefore, this fall in Corning he has designed the program to allow all who wish to visit two of the greatest museums in the country an opportunity to do so without missing any of the conference program. In Corning, the third most visited tourist attraction in New York State, they have the world famous Corning Museum of Glass and the Rockwell Museum of Western Art. There will not be a program on Wednesday afternoon to allow anyone who would like to visit either, or both, of these international attractions to do so. Group tours and rates will be made available and published in the next issue of the IABPA News.

The program will resume Wednesday evening to make up for having the afternoon off. Papers will be presented from 7:00 PM until 10:00 PM and Herb promises to be the last speaker so you can leave early and not miss anything important if you wish.

Following the official welcome on Wednesday morning several papers will be presented. Lunch will be on your own this day as well as Thursday and Friday. There are many fine places to dine within easy walking distance of the Radisson. As stated above, the afternoon will be free to visit the vendors and do whatever you please. More about local attractions later. The meeting will reconvene at 7:00 PM for additional papers.

Thursday will be a day for presentations both during the morning and afternoon. We will break a little early as the staff has to set up for our banquet in the meeting room. Herb reminds us we are meeting in the room where IABPA was formed and it is not the most spacious location; but it does hold a lot of history for us.

Herb is still trying to work out the details of having what is normally an outside pig roast served inside a hotel. For some reason the chief chef doesn’t want the hog cooked inside! For
those who may never have enjoyed a pig roast it will be both interesting and a delightful gustatory experience. Naturally, there will be alternate choices for your banquet entrée.

Friday morning will again consist of papers. Our annual business meeting will be held after lunch and, when ended, will conclude our annual meeting. Everyone can then go home or stay for a few days to see whatever it is that they may have missed in Corning.

The hotel where the meetings will be held during the 2006 Annual Meeting of IABPA is the Radisson Hotel in Corning, New York. This is a most significant location because while this location was a Hilton Hotel in 1983, it is the place where IABPA was formed on 18 November 1983. Our meetings will be held in the very same room where IABPA was first conceived and everyone can reflect back and imagine if any of those first twenty-two members could have ever anticipated that their initial efforts could have resulted in what is now such a vibrant worldwide organization. I know I couldn’t.

Herb MacDonell, Founder

Rates for rooms at the Radisson Hotel are:

- Guestroom rate: $102 plus 12% tax.

The Radisson has reserved 100 rooms for our group which, if necessary, could be increased. Those who wish to stay at the Radisson are advised to make their reservations as soon as possible to avoid disappointment should they be filled up early. Be sure to mention that you are with IABPA, the Bloodstain Group, when you register.

The contact information is:
Radisson Hotel Corning, 125 Denison Parkway East, Corning, New York 14830

Rates for rooms at the Holiday Inn Staybridge Suites are:

- Studio (Queen): $60 plus tax.
- One Bedroom (2 Double/King): $89.00 plus tax.
- Two Bedroom (Queen and 2 Double): $109 plus tax.

Be sure to mention that you are with IABPA, the Bloodstain Group, when you register. They offer a complimentary hot breakfast and free snacks Tuesday-Thursday at 5:00 PM with free beer and wine. Every suite has a full kitchen and a pantry in the lobby. The Staybridge is about five minutes from the Radisson if you drive or ride. Otherwise it is a refreshing 15 minute walk. Getting a ride with other delegates should be no problem.

The contact information is:
Staybridge Suites, 201 Townley Road, Corning, New York
Telephone: 607-936-7800, Fax: 607-936-7900, or www.staybridge.com
Rates for rooms at the Comfort Inn are:

One Bedroom (2 Double): $60 plus tax.

Be sure to mention that you are with IABPA, the Bloodstain Group, when you register. The Comfort Inn is probably the most economical as two can stay for the price of one. They offer a complimentary hot breakfast. The Comfort Inn is about a five minutes drive from the Radisson or a brisk fifteen minute walk. It should be no problem in getting a ride from others who are attending the annual meeting.

The contact information is:
Comfort Inn, 66 West Pulteney Street, Corning, New York 14830
Telephone: 697-962-1515, Fax: 607-962-1899, or www.hjerow@visions-hotels.com

IMPORTANT NOTICE!

Corning, New York is not a large city. Rather, it has the small town charm than can only be found in more rural areas. People are friendly, they do not rush, and they say, “Hello” to you on the sidewalk. We do not have 1,000 room hotels and for that reason I strongly suggest that if you plan to attend the October Annual Meeting of IABPA you make you reservations sooner rather than later. We may not be able to have more than 100 rooms blocked off for us at the host hotel, the Corning Radisson Hotel. However, many of our members have stayed in Corning before and are familiar with the wonderful accommodations the Staybridge Suites have to offer and I suspect they will elect to stay there as it is not that far from the Radisson. Likewise, many are familiar with the Comfort Inn and may wish to stay there.

In the event we have a much larger turnout for the October meeting than expected I have listed below several other possible motels where rooms ought to be available. Also, some people may prefer one of these locations to those listed above. If so, you must call them directly to make your reservations.

Other Accommodations in the Corning Area are:


Fairfield Inn, Corning, New York. Telephone: 607-937-9600

Hampton Inn, Painted Post, New York. Telephone: 607-936-3344

Holiday Inn, Painted Post, New York. Telephone: 607-962-5021
GETTING TO CORNING, NEW YORK

It is not difficult to get to Corning, New York. The problem is that once there you won’t want to leave! If you come from far away and wish to fly the closest airport is the Elmira-Corning Regional Airport (ELM). I can see the airport out of my office window but it is 14 miles down the valley from here. Both US Airways and Northwest fly into and out of this airport. Only problem, it is expensive.

Many people, like a lot of our local residents, prefer to use the Rochester, New York Monroe County Airport (ROC) to our North. The lower rates to and from there more than make up for renting a car for a week and driving the 90 miles to Corning. There is not one traffic signal from the Rochester airport until you come into Corning and it is all on a four-lane freeway with no tolls. Besides, that way you will have a car here and if you stay at the Staybridge it will be handy. Very important, if you elect to fly into the Rochester, New York airport be sure your travel agent does not get confused and send you to Rochester, Minnesota as it has happened before!

If you plan to drive the map below should be helpful.

Herb MacDonell, Chairman
IABPA Conference 2006
REGISTRATION FORM

Please Print

LAST NAME ____________________________     FIRST NAME ______________________

IABPA MEMBER YES ______ NO ______

NAME FORMAT FOR ATTENDANCE CERTIFICATE____________________________________

AGENCY ______________________________________________________________________

ADDRESS _____________________________________________________________________

CITY ____________________________ STATE ________ ZIP CODE __________________

COUNTRY______________________TELEPHONE ______________________________________________________________________

E-MAIL _____________________________________________

SPOUSE/COMPANION NAME ____________________________________________________

Will guest(s) attend banquet?  Yes ___ No ___       Extra Banquet Ticket(s) $55.00: ___

REGISTRATION (Includes Banquet) Paid by 8/31/ 2006: $200.00  
Paid after 8/31/2006: $230.00  
On-site Registration: $250

Student Registration (Includes Banquet) Paid by 8/31/06: $175  
Paid after 8/31/06: $195

Make checks payable to: IABPA  
Federal ID # IABPA 52-1597063

Refund Requests Must Be Made Before 9/1/2006

Mail registration form and payment to:
Herbert L. MacDonell
Box 1111, Corning, NY 14830
Telephone: 607-962-6581
Fax: 607-936-6936
E-mail: forensiclaboratory@stny.rr.com

For credit card payments contact:  
Norman Reeves  
Telephone: 520-760-6620  
Fax: 520-760-5590  
E-mail: norman@bloody1.com

On-site registration will begin at 3:00 PM on 17 October 2006 at the Radisson Hotel.
Flight Number, Date, Time of Arrival – if known: ________________________________
CALL FOR PRESENTATIONS

If you have a paper to present during the 2006 Annual Meeting of IABPA please contact the Conference Chairman, Herbert MacDonell, and provide the information below. Either send a fax to him at: (607) 936-6936 or send it as an attachment to an e-mail to him at: forensiclab@stny.rr.com. You can also mail it to him at:

Post Office Box 1111, Corning, New York 14830

Research papers are of primary interest, however, case reports and miscellaneous material is still most welcome. There are only so many hours available so do not wait until it is too late to be put on the program before sending your information.

IABPA 2006 SPEAKER INFORMATION

Name:_____________________________________________________________

Affiliation:_________________________________________________________

Address:___________________________________________________________

Title:______________________________________________________________

Please submit A) an abstract of your paper (suitable for inclusion in the conference notebook), B) the time you will require (up to 30 minutes), and C) a short biography (again, suitable for inclusion in the conference notebook). If there is more than one author clearly identify which one will be the presenter.

What equipment will you require?

( ) PowerPoint Projector

( ) Laptop Computer

( ) 35 mm Slide Projector

( ) Empty 35 mm Carousel Magazine(s)

( ) Overhead Projector

( ) VHS Tape Player and Large TV Monitor

( ) Other: ____________________________________________________________

It is expected that those who require a laser pointer will bring their own but we will also have a backup available.
Herb MacDonell, Chairman of IABPA 2006 Annual Conference, has secured very attractive group rates for two of the most outstanding museums in the East. These and the Corning Museum of Glass and the Rockwell Museum of Western Art. The latter truly has, The Best of the West in the East. If you don’t think you would appreciate Western art go anyway, you just might be delightfully surprised.

It is the Corning Museum of Glass that makes Corning the third most visited tourist attraction in New York State behind New York City and Niagara Falls. You should plan on at least three hours to see this amazing attraction. There are two nice cafeterias in the Glass Museum so you might leave the meeting Wednesday noon and have an inexpensive lunch right there. The rates below will be given to anyone who shows their IABPA name badge:

<table>
<thead>
<tr>
<th>Museum</th>
<th>Rate</th>
<th>Original Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corning Museum of Glass</td>
<td>$9.00</td>
<td>$12.50</td>
</tr>
<tr>
<td>Rockwell Museum of Western Art</td>
<td>$5.50</td>
<td>$6.50</td>
</tr>
<tr>
<td>Combination ticket for both</td>
<td>$14.40</td>
<td></td>
</tr>
</tbody>
</table>

*You can purchase a combination ticket at either museum.

Abstracts of Recent BPA Related Articles Published in the Scientific Literature


Abstract

Articulating a Concise Scientific Methodology for Bloodstain Pattern Analysis [Saviano, 2005] exposed and attempted to explain, in an easy-to-understand manner, the steps involved in reaching a conclusion. This article attempts to further explain the application of scientific method to bloodstain pattern analysis, detailing additional steps and the specific questions posed in that process.


Abstract

The questions that are asked of forensic scientists during the course of a criminal investigation and during subsequent court proceedings are of varied forms. This paper attempts to place these questions into broad generic types and explores the difference in the inferential process that a scientist must employ when forming opinions that help answer these questions. From this model, a working definition of different roles and attributes for forensic scientists is described which may offer greater clarity for both practitioners and users of forensic science.

Abstract

Bloodstain pattern analysts are sometimes called upon to determine the point of origin of a pattern of bloodstains. A derivation of expressions for the uncertainties of $\delta X$ and $\delta Y$ in the coordinates of the point of origin $P(X,Y)$ of two bloodstains on a surface has recently been published. These uncertainties were expressed in terms of the uncertainties in the measured distance between the bloodstains and the uncertainties in the angles of impact of the bloodstains. This paper extends the derivations in the previous work by expressing the uncertainties in the coordinates of the point of origin of two bloodstains in terms of the uncertainties in the length and width measurements from which the angles of impact of the bloodstains are calculated.

Recently Published Book


BOOK REVIEW

Herbert Leon MacDonell

Crime Scene Investigation, Reader’s Digest, Pleasantville, New York, Elwin Street Limited, London. 2004, 192 pages, Introduction by Cyril H. Wecht,

I recently had the misfortune to review what appeared to be a worthwhile forensic textbook; unfortunately, it isn't. This book, Crime Scene Investigation, introduced by Cyril H. Wecht, MD, JD, is anything but worthwhile as it is so full of errors that it is obvious the Reader's Digest has no interest in accuracy or they would have had a peer review of the trash contained in this 192 page collection of mistakes by a variety of authors, few of whom seem to understand the topic about which they have written.

Although most sections contain an abundance of errors, I shall initially limit my comments to those directly associated with the discipline of bloodstain pattern interpretation. I shall leave corrections and criticism of the forensic pathology sections to those who will detect medical errors beyond that which I have pointed out on page 30 below.

Specifically:
Page 21: "bloodspatter" is written as "blood splatter", a basic error. The accepted term is “bloodspatter”, one word, not two.
Page 23: "blood splatter" again appears.
Page 30: In this unbelievable diagram, the location of postmortem lividity, the settling of blood within the body after dilation of the capillaries flowing after death, is shown to be in those locations where it could not be present. Compression of tissue, due to pressure from the weight of the body, prevents blood from settling into these areas. The diagram shown has it completely backwards with blood settling into the compressed areas.
Page 67: Bloodstain patterns shown in this illustration are reported to indicate the direction of fire. This, of course, is impossible. It is not possible to determine whether the bloodstains
shown in this illustration resulted from forward spatter, traveling in the direction of the projectile, or back spatter, traveling back toward the firearm. That makes it impossible to establish the direction of the projectile. Of course if it is spatter, you could guess and have a fifty-fifty chance either way?

Page 72: The caption for the illustration on this page states, “..experts can reveal that the drops fell from a height of 70 ft. (21.3 m) and at a 90-degree angle with the impact surface.” This is utterly BPA of a different kind. After about 20 feet blood reaches its terminal velocity and after that there is no way to determine how far it fell before impact. Further, the angle of impact was not 90 degrees but, on the average for the three bloodstains at the bottom in this illustration, the angel of impact was 67.6 degrees, not 90 degrees.

Page 73: A rather incredible statement is made, "The diameter of the bloodstain is of little or no value; the size of the drops is dependent on the type of surface they impact, not the distance they fall." How can the size of a drop be dependent on the surface it has not yet struck? I suggest whoever wrote this, Dr. Shaun Ladham, reflect on this and either study physics and/or the English language.

While Joseph T. Dominick is responsible for the errors in nomenclature I feel Dr. Shaun Ladham is more to blame for making this book somewhat less than useful as even a doorstop for a cottage as it is barely ¾ inches thick. Of course, if one were to tear the pages out they might be useful as paper to start a fire in someone’s fireplace.

Having said all the above, it is possible that this book might serve some worthwhile purpose for grade school children who wonder what all those TV forensic shows are all about. Since the majority of these programs are no more accurate than this book, these young readers will not realize how badly both are and possible develop an interest in our fascinating discipline. Hopefully, when they attend college, they will learn the difference between real forensic science, junk science, and bad books that are written and contain multiple errors, such as this one.

Professor Herbert Leon MacDonell, ScD, Director
Bloodstain Evidence Institute
Corning, New York
Bloodstain Pattern Analysis in the News

Alexei Pace

Presented below are news articles that feature bloodstain pattern analysis. Links are active at the time of writing (mid-August 2006), however they may be put offline after a few weeks. These news items are distributed through the ‘Bloodstain-Patterns’ mailing list and discussion forum, which counts 200 members and to which one may subscribe by e-mailing me at ap@onvol.net. All case details published are as found in the public domain and were acquired through online press websites. The author is not responsible for any misinterpretations by the press however any clarifications, if required, shall be published in the next edition. URL’s are being presented in the tinyurl.com format.

Analyst testifies at Forte trial
Fayetteville Online - Fayetteville NC, USA
http://tinyurl.com/ek9go

Duane Deaver, a bloodstain pattern analyst for the State Bureau of Investigation, testified that the shape and volume of the blood left on the floor and walls of Teresa Forte’s living room help show how she was beaten and stabbed to death. “It’s impossible to use blood spatter to say where in the home the violence started”, Deaver said, “because the initial blow would not have spread blood. Sometimes it takes a number of blows before a victim bleeds enough for blood to drip or splash from the body.” The bloodstains were also layered. “One made when something bloody touched the wall was covered up by one made by blood spattering the wall”, Deaver said that this indicates a long period of time for a beating or a stabbing to occur.

Expert on bloodstains says OJ really was innocent
Press & Sun-Bulletin - Binghamton, NY, USA
http://tinyurl.com/kqexp

"O.J. Simpson is not guilty of that crime," said Prof. Herbert MacDonell, who has been in the forensic science business for more than half a century. Simpson was acquitted in 1995 in the California murder of his estranged wife and her friend. In another part of the story, MacDonell says that he has little patience for television's forensics crime dramas, including the “CSI” shows. He watched one episode of CSI and has been forbidden by his wife to watch any more because he complained about the show the entire time it was on, he said.

Gilley DNA matches jeans evidence
Daily News Journal (subscription) - Murfreesboro, TN, USA
http://tinyurl.com/owyk6

Trial of David Gilley, charged with the murder of his ex-girlfriend. Blood pattern analyst Jerry Findley found impact blood stains on the right front, side and rear of a pair of jeans from the belt loops to the knees that indicated the person kneeled or moved around the victim during the beating.

"There's no way for blood to get to the rear unless the person changes directions," Findley said. "In my opinion, based on the impact stains, they were being worn."
"She was not beaten where she was found," Findley said, explaining there were no impact bloodstains on the vegetation around the victim. Under cross-examination by defense attorney Roger May, Findley said the killer stood or kneeled over the victim while she lay horizontally on the ground.

Victim's husband takes stand in teen's murder trial
San Jose Mercury News - CA, USA
http://tinyurl.com/q6d33

Trial of a 17-year old, regarding the murder of his neighbor Pamela Vitale. Criminologist Alex Taflya detailed bloodstains found on the door, walls, carpet and ceiling of the 650 square metres house where the victim lived. Because of the location of the marks, Vitale "was low to the ground when most of the injuries were being inflicted," Taflya testified. The day after viewing the crime scene photos, jurors were shown items that Taflya said were probably used in the attack: thick pieces of moulding, two large flashlights and a shattered vase found near Vitale's body. Daniel Horowitz, the victim’s husband, said the item was given to the couple as a wedding gift.

Organizational Notices

Moving Soon?

All changes of mailing address need to be supplied to our Secretary Norman Reeves. Each quarter Norman forwards completed address labels for those who are members. Do not send change of address information to the NEWS Editor. E-mail your new address to Norman Reeves at:

   norman@bloody1.com
   Norman Reeves
   I.A.B.P.A.
   12139 E. Makohoh Trail
   Tucson, Arizona 85749-8179
   Fax: 520-760-5590

Membership Applications / Request for Promotion

Applications for membership as well as for promotion are available on the IABPA website:
IABPA Website: http://www.iabpa.org

The fees for application of membership and yearly dues are $40.00 US each. If you have not received a dues invoice for 2006 please contact Norman Reeves.
Training Opportunities

October 23-27, 2006
Bloodstain Pattern Recognition Course
Northwest Bloodstain Pattern Association
Edmonton, Alberta, Canada
Course Coordinator: S/Sgt. John Forsythe RCMP
E-mail: jon.forsythe@rcmp-grc.gc.ca

November 13-16, 2006
Basic Crime Scene Workshop
Twinsburg, Ohio
E-mail: www.forensictraining.us

November 13-17, 2006
Bloodstain Evidence Evaluation
Columbus, Ohio Police Dept. Training Academy
Instructor: Robert W. Young, Jr.
Tel: 614-833-9708
Tel: 614-565-1984
E-mail: youngschtr@aol.com

December 4-8, 2006
Bloodstain Pattern Analysis Workshop
Miami-Dade Police Department
Specialized Training Department
Miami, Florida
Contact: Toby L. Wolson, M.S.
Miami-Dade Police Department
Crime Laboratory Bureau
Forensic Biology Section
9105 NW 25th Street
Miami, Florida, 33172
Tel: 305-471-3041
E-mail: twolson@mdpd.com

December 11-15, 2006
Advanced Bloodstain Pattern Analysis Course
Hosted by the San Diego County Sheriff's Regional Crime Laboratory
San Diego, California
Instructed by Paul E. Kish and Stuart H. James
Contact: Paul E. Kish
Tel: 607-962-8092
E-mail: pkish@localnet.com

January 8-12, 2007
Bloodstain Evidence Institute
Kings College
Wilkes-Barre, Pennsylvania
Contact: Professor Herbert Leon MacDonell, Director
P.O. Box 1111
Corning, New York 14830
Tel: 607-962-6581
Fax: 607-936-6936
E-mail: forensiclab@stny.rr.com

January 22-24, 2007
Association for Crime Scene Reconstruction - 16th Annual Conference
Sheraton Downtown
Tacoma, Washington
Contact: ACSR Website at www.acsr.org
or
Matthew Noedel
Noedel Scientific
E-mail: mnoedel@att.net
Website: www.noedelscientific.com
February 5-9, 2007
Basic Bloodstain Pattern Analysis Course
Des Moines, Iowa Regional Police Academy
Des Moines, Iowa

Instructors:
Stuart H. James
Norman Reeves
Rex Sparks
Contact: Rex Sparks
Des Moines, Iowa Police Dept.
25 East First Street
Des Moines, Iowa 50309
Tel: 515-283-4804
E-mail: RTSparks@dmgov.org

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April 30 – May 4, 2007
Bloodstain Evidence Institute
Corning, New York

Contact: Professor Herbert Leon MacDonell,
Director
P.O. Box 1111
Corning, New York 14830
Tel: 607-962-6581
Fax: 607-936-6936
E-mail: forensiclab@stny.rr.com

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September 24-28, 2007
Bloodstain Evidence Institute
Corning, New York

Contact: Professor Herbert Leon MacDonell,
Director
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Corning, New York 14830
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Fax: 607-936-6936
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Training Announcements for the December issue of the 2006 IABPA News must be received before November 15, 2006
The 2006 IABPA Annual Conference to be held in Corning, New York is fast approaching. Charter members Norman Reeves and I are looking forward to re-visiting the meeting room at the Corning Raddison Hotel (Formerly the Corning Hilton) where this organization was founded during Herbert MacDonell’s first Bloodstain Institute in 1983. Norman and I have had frequent conversations over the years about the growth of the membership and more recently the advancement of the discipline of Bloodstain Pattern Analysis in Europe and Australia. Andre Hendrix and the Zeeland Polite in the Netherlands have published a special publication with reference to the first European IABPA conference held from 15-17 February 2006 in Middelburg, the Netherlands. You will recall that the conference proceedings were highlighted in the March 2006 issue of the NEWS. This is a beautiful and memorable book about this historic conference and Andre will be bringing some copies to the conference in Corning, NY.

I continue to receive requests for articles from old copies of the NEWS from university libraries, the latest being from Pace University in New York. Apparently, students are actively doing research in bloodstain pattern analysis and it is good that our organization is able to provide information. It should encourage members to continue to submit research article and case studies for future issues of the NEWS.

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Daniel V. Christman  1997-1998
Phyllis T. Rollan  1999-2000
Daniel Rahn  2001-2002

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