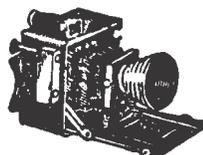




THE PRINT

*The Official Publication of the Southern California Association of Fingerprint Officers
An Association for Scientific Investigation and Identification Since 1937*

January / February 2004 Volume 20 Issue 1



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A Study of the Effectiveness of Cyanoacrylate Fuming in a Vacuum Cabinet and a Heat/Humidity Cabinet

(This article is reprinted from volume XX issue IV (March 2003) of the "4N6" published by the Iowa Division of the IAI.)

ELIZABETH NELSON, Intern
CARL BESSMAN, Criminalist
Iowa DCI Criminalistics Laboratory
Des Moines, Iowa

Cyanoacrylate (CA), or "super-glue", fuming is a method commonly used to develop latent prints. However, there have been advances in the technology used to perform this technique, and two new CA development cabinets were recently acquired by the Iowa DCI Lab through a joint venture with the Midwest Regional Forensics Center (MFRC) at the Ames Lab/ISU complex in Ames, Iowa.

The first cabinet controls the levels of heat and relative humidity at which fuming occurs through the use of a humidifier/dehumidifier, two small interior fans and a hotplate. As seen in Picture 1, the cabinet is essentially a glove box with a side compartment that has a thick, tightly sealed glass plate on both the inside as well as the outside. The side compartment allows objects to be added to the chamber, visually examined, or removed while fuming is occurring without losing any of the fumes or humidity.

The other cabinet, or chamber, that was used for this research creates a vacuum in which to fume items. This chamber is a tube made of machined aluminum, shown in Picture 2, with "caps" that are sealed with clamps and gaskets on both ends. There are two observation ports in the tube so that the objects can be observed during the process to prevent over fuming. A vacuum pump with an internal pressure gauge is attached to the chamber. The CA was placed in a glass dish, which was warmed with hot water from the tap before being placed in the cabinet. Decreasing the internal air pressure through the use of the vacuum pump to approximately one-half atmosphere then caused the CA to vaporize.

Both of these techniques have been researched previously with varying results. For our experiment, we tested several different substrates in both cabinets to determine the best way for prints to be developed. The following is a list of substrates that were tested:

Microscope Slides, Aluminum Foil, GLAD® Bags, Recycled Black Bags, Styrofoam Cups, Clear Plastic Cups, Duct Tape, Plastic Page Protectors, Sandwich Bags, Clear Plastic Bags, Solid White Plastic Cups, Opaque Plastic Cups, Aluminum Cans.

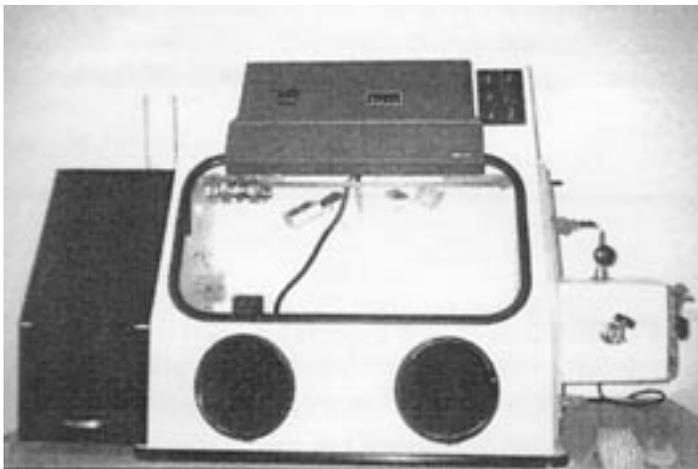
Standard runs for comparison purposes were performed using the Iowa DCI Lab's standard CA fuming cabinet (at ambient relative humidity) and following the DCI Lab's standard procedure. Ten runs were performed using the first 10 substrates in each run except one, which was missing duct tape. These standards were then used to compare amount of ridge detail developed, clarity of prints, amount of background color, and time of development to the results achieved using the two new techniques. From this it was anticipated to determine which technique would be the most successful for each type of substrate.

Results for each cabinet were varied; however, on most substrates both of the new cabinets gave better results than those achieved using the standard cabinet. Only duct tape and aluminum foil gave slightly disappointing results, with the standard cabinet giving better results than the two new cabinets. Although both cabinets produced generally good prints on these two substrates, they were often very faint and the ridge detail was dotted. Both cabinets gave good results on Clear Plastic Bags, Sandwich Bags, and Clear Plastic Cups. The vacuum cabinet generally gave better results for Glass Slides, Plastic Page Protectors, and Styrofoam than either the heat/humidity or standard cabinet. However, for GLAD® Bags, Black Plastic Bags, and in general any plastic substance, the heat/humidity cabinet gave the best results. The last three substrates were tried in each of the cabinets, but only a limited number of runs were done for each. The aluminum cans and white plastic cups gave good results in both of the cabinets while the opaque plastic cups provided more contrast between

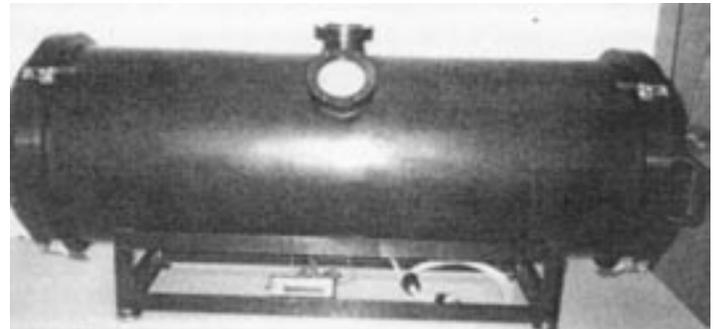
the fingerprint and background when developed using the heat/humidity cabinet. Overall, both cabinets gave better ridge detail with less background coloring than the standard cabinet. It should be noted that this study was conducted in May, June and July of 2001 when the ambient relative humidity was still fairly high.

In conclusion, both the heat/humidity and vacuum cabinets were found to give significantly better results than previously achieved using the standard cabinet. These new techniques may significantly improve the ability of criminalists to successfully develop latent prints on many different substrates.

Postscript: The latent print examiners at the Iowa DCI Lab have been using the new glue cabinets for approximately one and a half years. In that time it is the considered opinion of all of the examiners that items processed with the new cabinets produce a 50 percent increase in the number of latent prints developed over the old system. It is not unusual to see the relative humidity in our laboratory at less than 10 percent during the winter and above 70 percent during the summer. The ability to control these ambient fluctuations has made the new CA fuming cabinets a huge success.



Picture 1



Picture 2

Which Came First, the Blood or the Print?

The Role of Experimentation in Forensic Casework

(This article is reprinted from the 3rd Quarter issue, 2003, of the "CACNEWS", published by the California Association of Criminalists. It was downloaded from the online archives at www.cacnews.org/archives.htm.)

NORAH RUDIN

KEITH INMAN

In the spirit of asking the class to participate when the instructor hasn't had time to prepare the lesson, we are asking the readers of this column to help us out with our next column while we try to finish a book.

Sometime in the last century, in a motel in the Southern U.S., a young woman was found dead in the bathtub. It appeared that she had been bludgeoned where she lay and left to die. Blood was everywhere. Forensic experts were called to the scene. They dusted for prints, revealing a palm print amidst an area of light blood spatter. The print overlapped a blood drop of about 1 mm square. The crime scene technician lifted the print, taking the blood spot along with it. The palm print was eventually matched to an employee of the motel. According to the work schedule, the man had cleaned the room just that morning. Thus the critical question became, which was deposited first, the print or the blood?

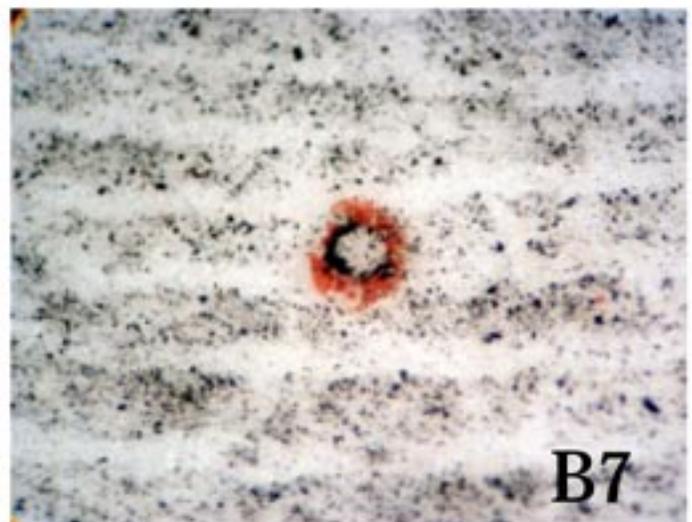
The technician who lifted the print, as well as a more senior fingerprint analyst, expressed the opinion that the print was left after the blood was deposited. A defense expert was brought in to review the case. He was not convinced that the print was necessarily deposited after the blood spatter, and he performed some experiments to test his hypothesis. He spattered some blood on a ceramic surface and watched it dry. (Amazingly, it actually did dry, even though he was watching it.) Next, he dusted the spattered bloodstains with black fingerprint powder. The criminalist then spattered blood on top of previously deposited prints and also applied prints on top of a fresh spatter pattern, in both cases finishing off with a dusting of black fingerprint powder.

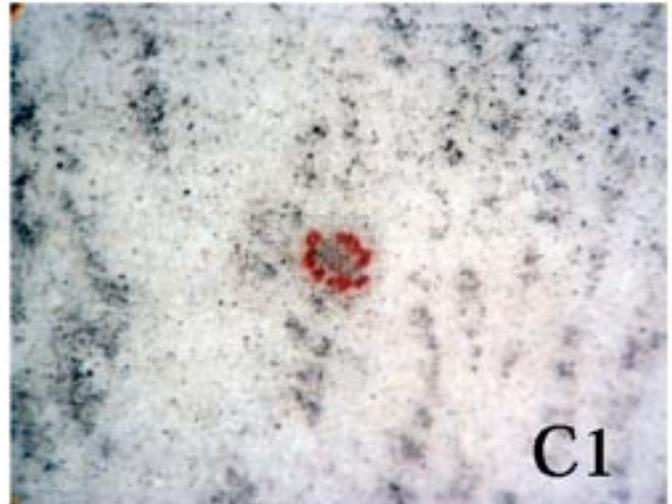
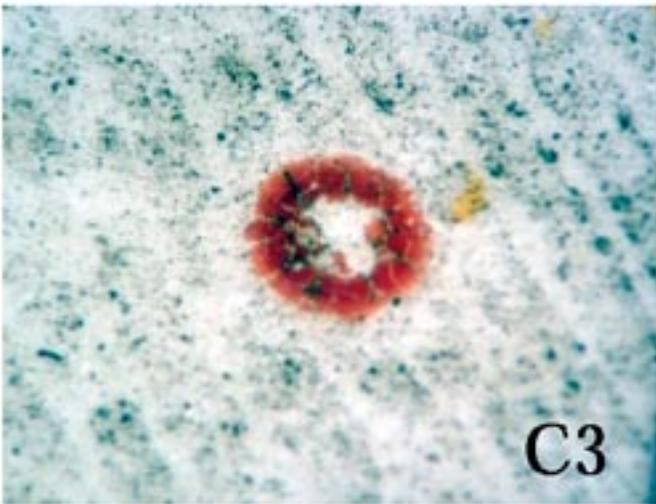
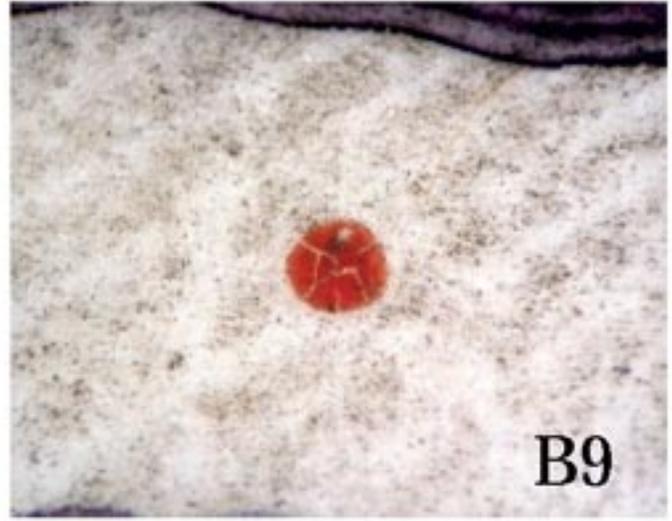
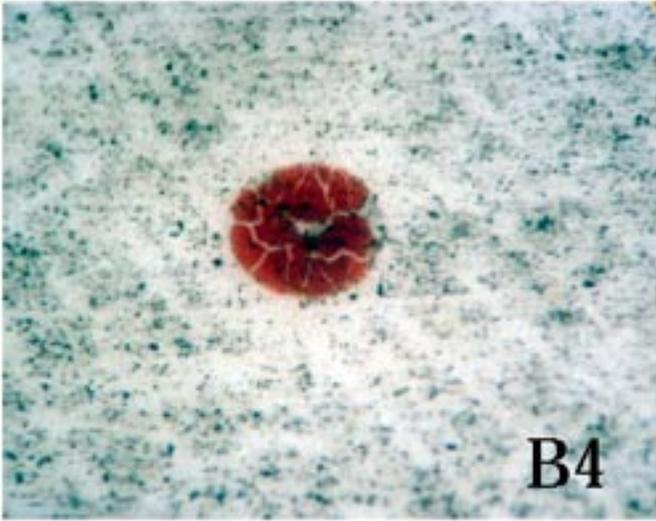
From the results of the experiments, he devised a test that he challenged several of his colleagues to take. Anyone who is old enough to remember this caper probably doesn't, so is in no danger of giving it away. On the next several pages are examples of some of the test photos. They are available in color at www.cacnews.org.

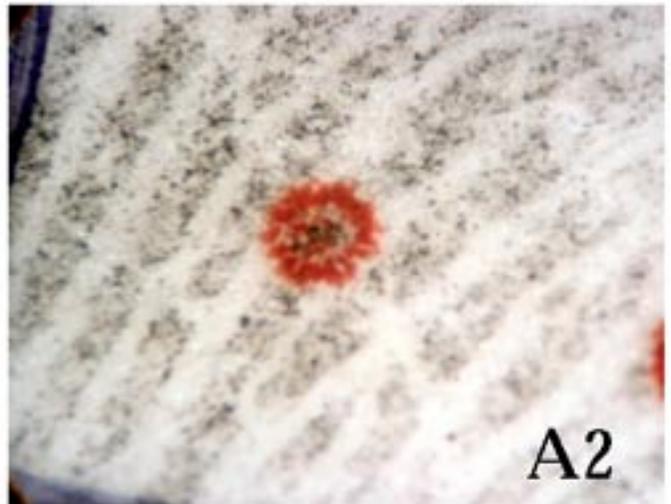
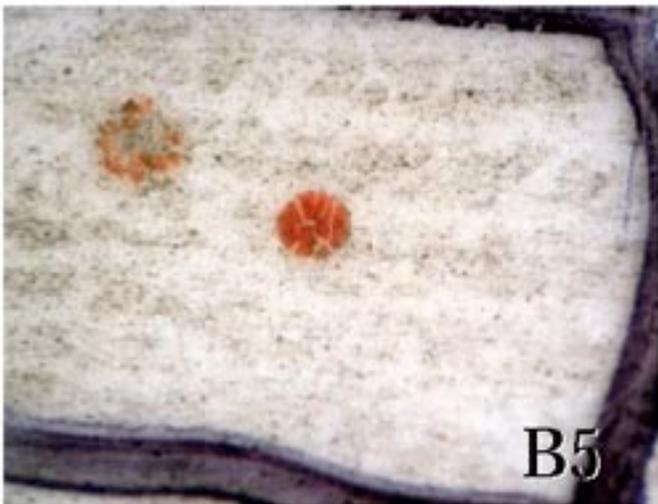
Your job, should you choose to accept it, is to answer the following question:

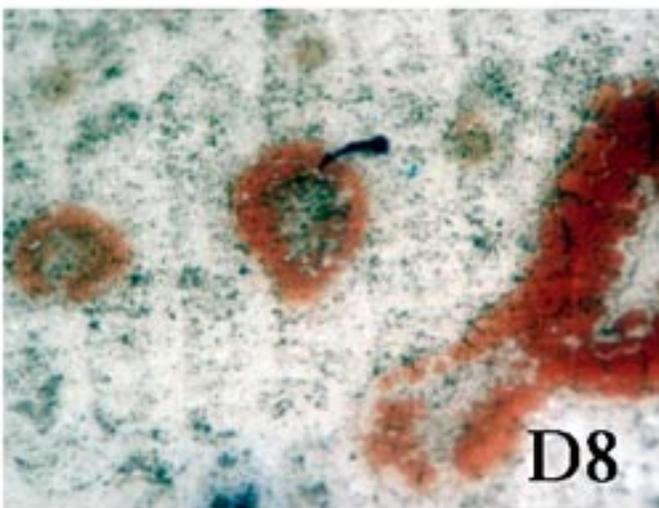
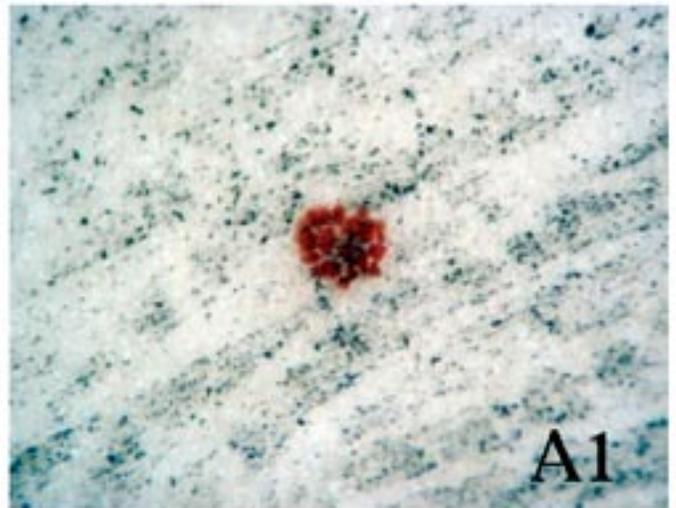
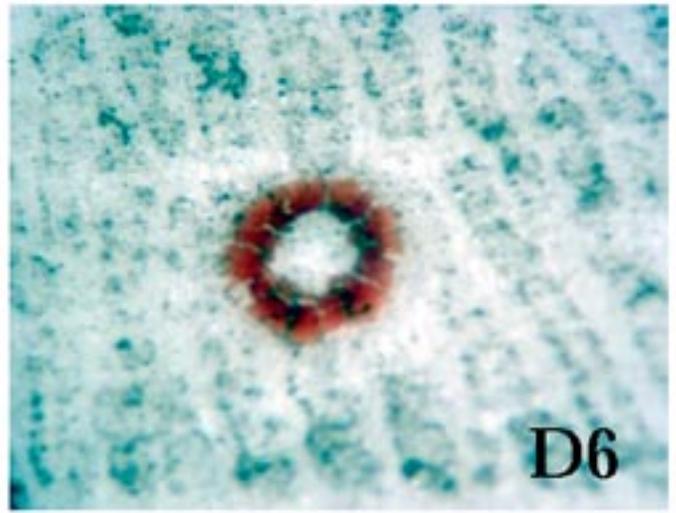
Was the fingerprint deposited before or after the blood drop?

In the next article, you will hear the *rest of the story*.









Which Came First, the Blood or the Print?

The Rest of the Story

(This article is reprinted from the 4th Quarter issue, 2003, of the "CACNEWS", published by the California Association of Criminalists. It was downloaded from the online archives at www.cacnews.org/archives.htm.)

NORAH RUDIN
KEITH INMAN

In the last installment of POL (previous article), we related a case wherein the expert was asked to opine which of two pieces of overlapping evidence was deposited first, a bloodstain or a palm print. The expert responded that the blood came first, followed by the palm print. This was devastating to the defendant, whose palm was determined to be the source of the print. Recall that the blood was deposited on a ceramic bathtub, dusted with black powder, lifted with fingerprint lifting tape, and placed on a white print card. This was the evidence used by the expert to determine the order of deposition.

The expert was asked the criteria by which he was able to conclude the order of deposition of these two evidence items. He responded that

- 1) the blood was "cracked," indicating to him that significant pressure had been placed on it;
- 2) some ridge detail exhibited an endpoint within the stain, rather than traversing both boundaries of the entire 1 mm stain;
- 3) he saw fingerprint powder in the cracks of the blood drop, indicating to him the presence of oils on the stain.

When challenged, the analyst could provide no supporting literature in which these criteria were established, but said they were taught at an FBI class.

A defense expert reviewed the case. He was not convinced that the print was necessarily deposited after the blood spatter, and he performed some experiments to test his hypothesis. He spattered some blood on a ceramic surface and watched it dry. Without any disturbance whatsoever it developed a cracked and crazed pattern, merely as a consequence of drying on this particular surface. Next, he dusted the spattered bloodstains with fingerprint powder. In the absence of any prints, either underneath or on top of the blood spatter, he observed that fingerprint powder infiltrated the cracks of the dried stains, and that "snow-fencing" of the powder against the stain concentrated the powder on one side. This created the illusion of a ridge overlapping one edge of the stain. Every criteria used by the expert to conclude order of deposition could be re-created in the absence of any latent print at all!

To complete the experiment, the criminalist then spattered blood on top of previously deposited prints and also applied prints on top of a fresh spatter pattern. In both instances he could find drops that either did or didn't show the apparently distinguishing characteristics observed in the case evidence.

From the results of the experiments, he devised a test that he challenged several of his colleagues to take. Everyone who agreed to take the test felt that they could tell whether blood or a print had been deposited first. He chose several examples that represented each of the possible test situations, and included instances in which the appearance of the spatter either supported or refuted (according to the criteria that these experts agreed were accepted by practitioners) what he knew to be the order of deposition. Of the five IAI-certified fingerprint examiners who took the test, no one had less than 10 years of experience, and the most senior examiner boasted 25 years of experience in fingerprint examination and comparison. The best score was 80% right, while the worst was 80% wrong - worse than guessing!

We published last quarter (Inman and Rudin, 2003) the stains used to test the examiners. Apparently none of you were quite so brave as those five examiners who originally agreed to take the test - hopefully a testament to progress in criminalistics. We now provide the key for the order of deposition of the blood and print for each sample. We leave to the reader the joy that comes from correlating the key with the photographs from the previous issue of *The CACNews*. The original evidence photograph is unfortunately no longer available for comparison.

| Photo | Key | Photo | Key |
|--------------|------------|--------------|------------|
| B6 | B1/P2 | B8 | B1/P2 |
| B7 | B1/P2 | B10 | B1/P2 |
| B4 | B1/P2 | C2 | P1/B2 |
| B9 | B1/P2 | B5 | B1/P2 |
| C3 | P1/B2 | A2 | B1/P2 |
| E10 | P1/B2 | C5 | P1/B2 |
| E9 | P1/B2 | D6 | P1/B2 |
| C1 | P1/B2 | D7 | P1/B2 |
| A3 | B1/P2 | A1 | B1/P2 |
| D8 | P1/B2 | C4 | P1/B2 |

B1/P2 = Blood first/print second

P1/B2 = Print first/blood second

We provide the following informal summary of (unpublished) experimental observations to illustrate different ways the pattern observed in a bloodstain might be created. In its present form, the information is intended solely as a source of contemplation and some intellectual amusement over your lunch—or perhaps as a stimulus to further experimentation of your own.

We use the lessons learned from this case as a caution against the *ad hoc* interpretation of nominally obvious physical evidence (hey, we've all done it!). Experimentation is required; we may not elevate our assumptions to conclusions without the requisite blood, sweat, and tears - and a bit of black powder.

References

- Pizzola PA., Roth S., De Forest P.R. *J. Forensic Sci.* 31(1):36-64, 1986
Inman, K., and Rudin, N. Which Came First, the Blood or the Print?
The Role of Experimentation in Forensic Casework. *The CACNews* 3rd Quarter, 2003, pg. 26

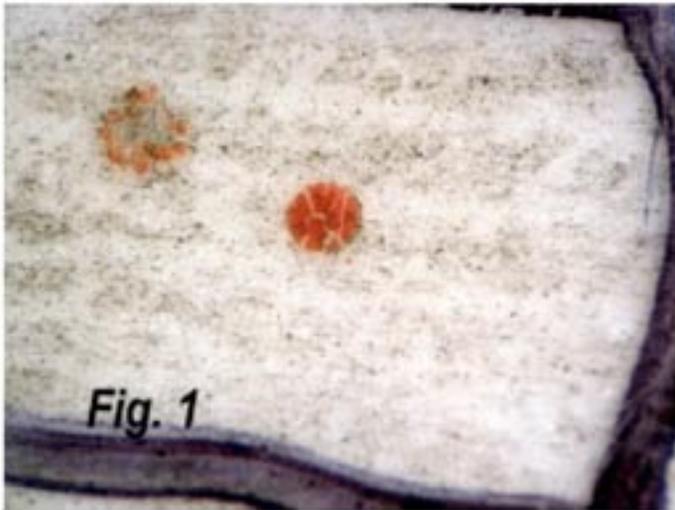


Figure 1. The stains in figure 1 were prepared by depositing the bloodstains, then depositing a palm print. They were then dusted with black powder, and lifted with fingerprint tape. Powder appears to be randomly distributed across both bloodstains, and no clear “ridge” can be detected running over the blood droplets. Three out of four experienced analysts declared that the print came first, followed by the blood. The fourth analyst made the same call, but was not certain, and would not have reported an order of deposition.

Figure 2. The stain in Figure 2 was prepared by depositing a palm print first, followed by blood droplets. They were then dusted with black powder, and lifted with fingerprint tape. The powder appears to run over the blood, along the “ridge” of the latent print. All four analysts declared that the blood was deposited first, followed by the print.

EXPERIMENTAL OBSERVATION/DERIVATION

CRACKS IN THE STAIN

All spatter dried within seconds to minutes of deposition on the porcelain. All of the stains were cracked or crazed, and all stains showed a concave center. This type of involution was reported by Pizzola (1986). The mere act of drying caused the stain to crack into pieces. Close inspection of such droplets indicates that the involution forms upon impact, and the cracks result from drying.

POWDER IN THE CRACKS

Stains dusted in the absence of any print showed powder infiltrating both the cracks and the involution.

RIDGES OVER THE STAIN

Dusting small dried stains in the absence of any print showed “snow-fencing” on one edge of the stain. This created the appearance of a powder-defined ridge starting up the side of the bloodstain, and continuing partway across.

LIFTING OF THE STAIN

For virtually all of the blood droplets lifted, only a portion of the stain was removed by the lifting tape. The portion removed tended to be the outer rings of the involution. While powder particles trapped between the bloodstain and the tape were picked up, other particles were left behind, along with some of the blood. Clearly, the stain pattern removed by the lift did not represent the entirety of the original evidence pattern observed on the porcelain.

President's Message

Why did I join the Southern California Fingerprint Officers Association?

The underlined reason for me to join SCAFO or the other professional fingerprint associations was to fill a need that I had for more knowledge. First, as a student of fingerprints, that need was for me to learn who's who in the profession. Second, was to get and read the associations publication that provides me with current information to further my knowledge in my discipline. Thirdly, get to know other individuals like myself who have similar professional interest. These are my reasons. Since we are members of SCAFO then there is a high probability these are your reasons also.

I made a decision 26 years ago to pursue a career in law enforcement and better yet, God willing, a career in fingerprint identification. I have been able to pursue and enjoy both those dreams largely through support from my spouse, my parents, my mentor and those individuals who believed in me and my sincerity. Without their support and the support from SCAFO, The International Association for Identification and The Fingerprint Society of the United Kingdom, and others organizations, that provide access to knowledge and leadership, I would not be addressing you now or looking ahead as SCAFO's President on the road to another fantastic year.

A new year is upon us and a new horizon. Each January the Executive Board meets to review old business and accept the challenges of new business. Directors eagerly accept the challenge hosting dinner meetings for you in the southern California region and provide speakers that are interesting to the membership. These challenges are neither difficult nor demanding but do respect a certain amount duty, commitment, trust and loyalty to the membership. The membership expects leadership from the Executive Board. And as your 2004 SCAFO President, I have sworn to duty to carry forward SCAFO commitments, traditions and culture and a promise to accept the challenges of this new horizon.

My first challenge is the inauguration of the Evidence Print Examiner Certification and Fingerprint Examiner Certification Programs. At our successful 12th annual October meeting, the membership present was asked to participate in deciding whether SCAFO should go forward with a certification program. Secondly, how many members felt would benefit from such a program. As I sat from the side lines and watched the overwhelming hands being raised it was obvious to me that the membership expected SCAFO to step up and deliver a certification program. And that's exactly what I am going to do as your President. At the January Executive Board meeting I will be selecting a Certification Chairperson and handing over to that Chairperson the notebook of our first member to apply for the Evidence Print Certification. I encourage all members to apply who aspire to have their training, knowledge and skill corroborated by The SCAFO Certification Board for the purpose of demonstrating technical competence. I wish to personally thank those individuals who have worked behind the scenes formulating the foundation of the certification program. This is truly an example of duty, commitment, trust and loyalty to the membership. As a Certified Latent Print Examiner, I encourage all active members to take advantage of any certification program available.

As individuals we tend to look side-to-side and constantly scanning the horizon looking for someone who will become our next Charles W. Wolford, Walter R. Scott, Robert D. Olsen or William (Bill) Leo. What we as individuals fail to do is to examine our own fortitude. With about 300 association members, each in your own way has what it takes to contribute to the association. I know because I have sat next to you at a dinner meeting one time or another. You talked about working on interesting cases. You responded to crime scenes. You analyzed evidence. You even made a fingerprint identification or two. One reason why SCAFO has been so successful over the years is because of individuals like you who care. Care enough to be a member. Attend meetings when able and benefit from presenter's who have dazzled us with their knowledge and experience. Remember, as a member you have pledged to pass along your experiences, good or bad, so that we can all learn. So if you have something you would like to pass along, volunteer to be a presenter at a dinner or lunch meeting. Encourage your co-workers to do the same or ask them for support. Teamwork is what this association is about. Contact a Board Member and get involved.

Lastly, I am truly amazed how many excellent comments I have received about this association from fellow examiners across the miles. I believe it's because the association has its members at interest by providing noteworthy speakers at the annual training seminars. Every other month, presenting dinner and lunch meetings so that each member has an opportunity to attend. And, SCAFO's internet website that allows others to follow our progress. Just the other day, I and Tom Washington, Director were contacted by the International Visitors Council of San Diego which plays host to international visitors under the auspices of the U.S. Department of State professional exchange: International Visitors program, to request a meeting between us and two key Greek government agencies responsible for applying biometric features in the new Greek passports. However, Mr. Nikolaos Skartsis, Hellenic Police Captain and Mr. Philippos Mitleton, Lawyer for the Hellenic Data Protection authority requested the meeting for an overview of SCAFO and to discuss best practices in biometrics. Needless to say, the meeting was educational. They learned about SCAFO and we learned a bit about the European Network Forensic Science Institute.

While I write this I am thinking of my journey to Mississippi to spend some good ole Southern hospitality with a truly gifted man, Mr. Ron Smith, CEO of Ron Smith and Associates. As I mentioned before I am a student of fingerprint identification and there is nothing better than spending some good quality time with the Master of Palms.

Fraternally Yours,

Ed Palma, President

MINUTES OF DECEMBER MEETING

DATE: December 6, 2003
LOCATION: The Boat House, San Diego, CA
HOST: Ed Palma
SECRETARY: Gina Russell-Durgin
PROGRAM: Installation of 2004 Executive Board
CALL TO ORDER: Business meeting, 1930 hours by President George Durgin
PLEDGE OF ALLEGIANCE: Lead by Jim Lawson
ATTENDANCE:

PAST PRESIDENTS: Alan McRoberts (1991), Jim Lawson (1995), Clint Fullen (1998), Bob Goss (2001).

EXECUTIVE BOARD: George Durgin, Ed Palma, Dennis Uyeda, Gina Russell-Durgin, Lisa DiMeo, Tom Washington, Jim Lawson, and Alan McRoberts. (Absent: Steve Tillmann, Susan Garcia, Elaine Sena-Brown, Craig Johnson, Bill Leo, and Clark Fogg.)

Members and guests present: ???

OLD BUSINESS:

Second Readings:

Andrea Duncan

Motion to accept: Gina Russell-Durgin
Second: Georgina Holmes Watson

Swear Ins by Past President Clint Fullen

Graham Jeffrey, Ventura Police Dept.
Adam Houg, San Diego Sheriff's Dept.

Installation of Executive Board:

2004 Board of Directors:

President: Ed Palma

1st Vice President: Dennis Uyeda

2nd Vice President: Susan Garcia*

Secretary: Gina Russell-Durgin

Sgt. at Arms: Tom Washington

Chairman of the Board: George Durgin

Directors:

Lisa DiMeo, Craig Johnson* (2003-2004)

Sarah Watson* and Mari Johnson* (2004-2005)

Treasurer: Jim Lawson (2003-2004)

Historian: Bill Leo* (2003-2004)

Editor: Alan McRoberts (2004-2005)

*In absentia

NEW BUSINESS:

First Readings for Active Membership:

Michelle Sherwood, DEA - Vista
Elsa Moncada, San Diego Sheriff's Dept.
Charles Russell, San Diego Sheriff's Dept.

Introduction of New Associate and Student Members

Martin Briano

ANNOUNCEMENTS:

Next meeting: February 7, 2004, Cask 'n' Cleaver in Fallbrook, hosted by Lisa DiMeo. Information will be forthcoming.

ATTENDANCE DRAWING of \$30.00 not won by:

Jo Latham, Dale Falicon, or Maria Navarro

DOOR PRIZES: All in attendance

(See's Candy gift certificates. Geat idea, Jim Lawson!)

MOTION TO ADJOURN:

Gina Russell-Durgin

Second:

Meeting Adjourned: 2030 hours



**Upcoming
SCAFO Meeting**

February 7, 2004

Bryan Burnett, M.S. Biology, M.S. Physiology
Meixa Tech Forensic Science Consulting Group
*Is "Forensic Science" an Oxymoron? And Other
Ponderings from a Stranger in a Strange Land*

**Cask 'n' Cleaver Steakhouse
Fallbrook, CA**

For additional information contact:
Lisa DiMeo
Arcana Forensic Services
(619) 464-3434
dimeo@scafo.org

"Every man owes a part of his time and money to the business or industry in which he is engaged. No man has a moral right to withhold his support from an organization that is striving to improve conditions within his sphere."

For subscription or membership information, or address corrections contact:

- President Theodore Roosevelt, 1908

S.C.A.F.O. Gina Russell-Durgin, Secretary

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Escondido, CA 90235

(760) 839-4770

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\$30.00 yearly for International Subscriptions

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SCAFO Members
get "yourname@scafo.org".
See instructions on the
website's email page.

-- Upcoming Events/Schools/Seminars--

February 5, 2004

S.C.A.F.O. Meeting
Lisa DiMeo
Arcana Forensic Services

February 16 - 21, 2004

A.A.F.S. Annual Meeting
Dallas, TX

April 3, 2004

S.C.A.F.O. Meeting Past Presidents' Night
George Durgin
USPHS

April 7 - 9, 2004

Nevada State Division 4th Annual Conference
Las Vegas, NV

May 10 - 13, 2004

C.S.D.I.A.I. 88th Annual Conference
Sacramento, CA

August 22 - 26, 2004

International Association for Identification
St. Louis, MO

Southern California Association of Fingerprint Officers
An Association for Scientific Investigation and Identification Since 1937