THE "PATENT PRINT"

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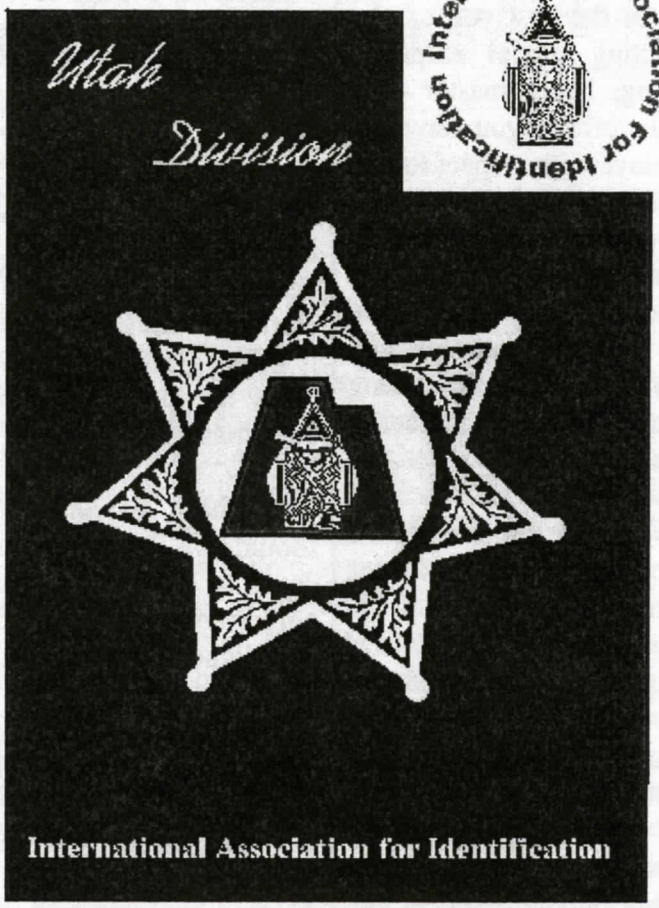

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President's Message

Greetings to all of you. Now that Winter is over and Spring has sprung on us with beautiful weather, I want to take a few minutes to reflect on a topic that I feel is of great importance for anyone employed in the forensic science field.

Many of the jobs I have held during my thirty years plus in the law enforcement field I considered as a hobby. I know many of you have hobbies and you strive to become the most knowledgeable you can about that hobby. You strive for perfection to be the best you can be whether it is constructing model ships in bottles, gardening, biking, being master of a computer game, etc. In effect, you have set goals for yourself to achieve with respect to that hobby. In a manner of speaking, the job you have in the forensic science field should become more than just a means to earn a living; it should also become your hobby. Hobbies are fun and relaxing. Why not have fun, relax, and get paid for something you want to do? Making your job a hobby also carries with it the goal to become the best you can.

Now, I do not normally like war stories unless I think they can help bring about a point of discussion. So here is my war story.

Let me first ask you a question. When did you first consider choosing the career field you are in or are currently pursuing? For me, I can vividly recall the day that I wanted to become a police officer. It was a very warm summer day on a farm in the Midwest. A neighbor boy, two year my senior, rode his bicycle over to our farm. He had with him a book of matches. He and my older brother went to the hayloft in our barn where the neighbor would strike a match and start a small fire on a bale of straw. My brother would then beat out the flame with a gunny sack. As fate would have it, one of the flames did not go out and the loft began filling with smoke and flame. We all got out safely, and fortunately the neighbors came over and extinguished the fire before much damage was done. It was then I met the County Sheriff and it was then that I decided I wanted a career in law enforcement. I was four years old at the time. When I turned twenty-one my goal (or as some of you may call it, my dream) became a reality. I have been involved in some aspect of law enforcement from that point on. Over the years I have evaluated my goals and from time to time, reset them to achieve something higher.

I always ask myself when I re-look at my goals, "Where do I want to be in 20 years?" That helps me focus on the steps I need to achieve in accomplishing my goal. I realize that not all goals we set are career enhancement. Some of the goals we set are of a personal nature and may be very short lived. Something like setting aside money for a new car or losing a few inches around the waist. When people contact me and inquire about how to get into crime lab work, I always ask them the 20 year question. It gives me a feel for what their career plans really are and I am more able to answer their questions.

With these thoughts in mind, each of you should live for more than just pay check to pay check or from day to day. If you do, you will only accomplish taking care of those immediate needs and not achieve true satisfaction in you career. Ask yourself the question and be honest with the answer. To become the best you can in your career in the forensic science discipline you have chosen, you need to set your goals on the steps needed for successful achievement. Those steps may include completing your degree, writing articles for publication, doing experimentation and publishing the results and above all, applying for and obtaining Certification in your discipline.

Gary Johansen

Development of Latent Prints using Titanium Dioxide (TiO_2) in Small Particle Reagent, White (SPR-W) on Adhesives

Nathan H. Williams
Karen T. Elliott, Criminalist II, CLPE

Excerpts from the paper. (The entire article, including methodology and casework, is available by emailing Karen Elliott at karen.elliott@utah.gov)

Abstract: Titanium Dioxide (TiO_2), a common paint pigment, can be used to develop latent prints on a variety of surfaces including many different types of adhesives. It can produce an especially useful contrast on dark tapes, particularly electrical and duct tape. Using TiO_2 in a Small Particle Reagent (SPR) mixed with Kodak Photo Flo 200 and water, usable prints can be recovered by direct application and rinsing, or by submerging evidence in a reagent containing the finely ground powder. Both the adhesive and non-adhesive sides of tape can yield viable results when correctly treated.

Overview

After experimenting with numerous types of adhesive surfaces as well as the non-adhesive sides and altering the application process, a wide array of results were produced. The white titanium dioxide particles present in the reagent adhere to the oily component in fingerprint secretions allowing an identifiable contrast between ridge detail and the substrate background (2).

All of the methods employed worked well on most types of colored tapes, especially dark electrical tapes and duct tape. However, many factors seemed to influence the outcome including the side of the tape (adhesive v. non-adhesive), type of tape, the quality of the original latent, treatment of the latent after its deposit onto the surface, exposure time, and the method of the developing process. Although results were produced from many different types of tapes, black electrical and gray duct tape made up the majority of sample substrates due to the fact they are by far the most likely to be entered as evidence. It is also possible to use this process in combination with Sticky Side Powder on opposite sides of the same piece of tape when one may produce better results than the other on a particular side (1).

All of the samples and most of the listed results reflect "planted" prints which have the obvious advantages of a controlled environment; they were evenly applied, have copious secretion material in each latent, were preserved by non-exposure to elements such as heat, sunlight, moisture, etc., and were not contaminated by foreign materials that usually accompany evidence. They were also on flat, undistorted pieces of tape, which is fairly uncommon. Observations are listed later that refer to actual evidence submitted. The results are generally the same as those found in experimentation, although not as pronounced.

Experimentation

Four possible applications were addressed for the recovery of latents prior to development to simulate likely evidence scenarios using variations of the SPR process. These four recovery scenarios include:

A) Direct application of latent to adhesive medium
B) Direct application of latent to non/ad side of medium
C) Direct application of latent to adhesive medium before being adhered to a non-porous surface and then removed
D) Direct application of latent to a non-porous surface before adhesive being applied and then removed (lifted)

In addition, four basic methods were used with TiO_2 and the results catalogued. These methods include the common method used in the field of spraying Sirchie's SPR-W directly onto the latent print and rinsing, applying a paste with a brush (similar to using Sticky Side Powder), and "washing" the tape in a heterogeneous mixture of suspended TiO_2 (1). These methods, although slightly altered for better results, owe their origin to previously tested processes, some of which were already in use in the field.

Observations and Suggestions

- Photograph with scale device beforehand so cutting into smaller, more manageable sections is possible. This is especially important if using a washing method, as too much in the pan at one time tends to become cumbersome and can brush the evidence surface against itself and the pan, smearing or destroying print quality (before or after being developed).

- If tape is folded over and stuck to itself or wrapped over itself (adhesive side over non-adhesive side), pulling it apart is very unlikely to produce any usable prints and may damage or ruin other latents on the evidence that could be successfully developed. This should only be done as a last resort once all other possibilities have been exhausted.

- The adhesive commonly used on black electrical tape once pulled away from itself, becomes a tacky or dried film and can't be penetrated by the physical process of SPR mixtures.

- Age of evidence (after being pulled apart) also seems to affect the viability of these areas of overlap or adhesion.

- Once physically pulled apart, it is extremely unlikely to recover any usable prints from adhesive to adhesive side on electrical or duct tape since these tapes are very elastic and tend to have very strong adhesive films. Attempting to pull apart may cause damage to other usable latents on evidence as well.

- Latents on the adhesive side of tape or latents on a non-porous surface before the tape is applied to that surface can be successfully recovered and developed using one of the described methods (Methods 1 or 2 are suggested) with the only difference being a lesser intensity.

- When using submersion, constant motion of the reagent must be sustained to prevent settling and adherence of the particles on areas of the substrate that do not contain print material.

Conclusion:

Titanium Dioxide used in Small Particle Reagent can be used in a number of different methods to develop latent prints from the adhesive and non-adhesive sides of tapes. It is especially useful in the development of prints on both sides of dark colored electrical tapes and duct tapes producing consistent results. The reagent can be applied in a paste form with a brush, sprayed on as a heterogeneous solution or evidence can be submerged in the reagent itself. The method most effective on electrical and duct tape is submersion due to the fact that methods of direct application tend to raise the risk of destroying the contrast between ridge detail and the background. This is primarily affected by exposure time when using direct application and should be kept to a maximum of a few seconds. Longer exposure times using submersion affect this contrast to a relatively small degree and can be repeated to improve results provided there is constant motion of the reagent over the evidence.

When using the submersion process, either by preparing a reagent of TiO_2 with water or by using commercially produced Sirchie's SPR-W, a mixture of the reagent with Kodak Photo-Flo can improve results dramatically by keeping the particle component suspended and less apt to adhere to areas of the substrate that do not have print secretion. Similar results can be produced using either reagent and success of the submersion process seems to depend more on the treatment during exposure than the type of reagent used. Rinsing in a 50:50 solution of tap water and Photo-Flo can also be used to improve contrast after exposure. This is especially effective when using direct application methods.

Prints can be developed using this process from the adhesive side of tapes whether the latent was directly deposited onto the adhesive and undisturbed or when tape has been removed from a surface. This is true whether the latent existed on the adhesive first or the surface first. Developed prints on the non-adhesive sides of tape are extremely delicate and care must be taken to avoid brushing these against any other surface. All developed prints should be allowed to dry and immediately photographed.

The success of this process in both an experimental setting and on actual submitted evidence demonstrates the validity of this process and its usefulness as an efficient and cost effective method of recovering prints on dark adhesives.

References:

1. Wade, David C. Development of latent prints with titanium dioxide (TiO_2). Journal of Forensic Identification 2002 52 (5), 551-558
2. Lee, Henry C. and R.E. Gaensslen, edited by. 2001. Advances in fingerprint technology. 2nd ed. Boca Raton: CRC Press LLC

Suppliers:

1. Kalamazoo Paper Chemicals, 8782 Gull Rd., Richland, MI 49083
2. Sirchie's Small Particle Reagent – White, (SPR-W),
   Sirchie Finger Print Laboratories, Inc., 100 Hunter Place, Youngsville, N.C. 27596

Certification News

By Kevin M. Patrick

In January of this year, I had the opportunity to attend the International Association for Identification Certification Meetings. The meetings were held in Morgantown, West Virginia and sponsored by West Virginia University.

The goal of the meeting was to standardize the process for all seven certification disciplines. This would include a single form for the initial application as well as for the re-certification process. In addition, all boards would require the same amount of re-certification points which can be acquired through several training areas including **approved** classes, division and national meetings, case work, teaching, etc. These requirements will be outlined in the new re-certification worksheet.

The meeting also focused on the responsibilities of local chapters to provide a means for its members to become certified. This would be accomplished through offering required training courses taught by **qualified** instructors, which have been approved by the individual certification boards, assisting candidates with the application process and providing proctoring for the various testing. This would not only increase the amount of certified examiners within the Utah Division of IAI but also be a source of income for the chapter since $50.00 from all applications are given for administering the exams.

The representatives from West Virginia University were terrific hosts. Not only did they provide funding for the entire meeting, but were very active in providing us with some insight to the potential of student and university participation in our organization. During a tour of the campus, we saw their new Forensic Identification teaching facility. This will provide future criminalists, crime scene investigators, law enforcement personnel and hopefully future IAI members with the technical and theoretical knowledge to succeed in our objectives.

After three days of discussions, we accomplished all the goals set forth for the meeting. We now await final approval by the Board of Directors before implementing the changes. These changes as well as other topics effecting certification will be discussed at the spring meeting held in Layton this April.

ANY NEWS IS GOOD NEWS

Anyone having any news, articles, or interesting cases and would like to be published, please send it to our Newsletter Editor, Bonnie Stewart. She requests that it be in Word format since she does not have Word Perfect. Thank-you.
bonnie.stewart@slcgov.com

From Galton Points to ACE-V:
one examiner's journey

by SANDRA WIESE
Northglenn Police Department, Colorado

Excerpts from the paper. (The following paragraphs were extracted from the paper, and therefore may appear out of context. The entire paper is available on CLPEX.com in the Reference section under *Identification Philosophy and Theory*)

Maybe the question shouldn't be so much what is "sufficient," but how the determination of "sufficiency" is in fact scientific. The question here is always some variation of: If I use my judgment to determine sufficiency, then it is a somewhat arbitrary and subjective decision and therefore inconsistent with the idea that friction ridge identification is a science instead of an art. I do believe that friction ridge identification is a science, not an art, but if I am going to testify to it, I have to be able to explain it *and* counter those people who came before me who have characterized it as an art. Cowger writes that T. Dickerson Cooke, one of the most respected workers in this field, wrote in 1973 that, "Pronouncing that two friction skin impressions…were or were not made by the same area of friction skin is an art, not an exact science. It is entirely a matter of judgment based on training and experience (Cowger, 146-147)."

How can I counter *that* on the stand? Have I been led down the wrong path? My confusion must be contagious and it may be spreading to the courts. More than one defense attorney and more than one defense expert has attacked fingerprint evidence on this basis alone. District Court Judge Michael had this to say in his dissenting opinion in U.S. v. Crisp:

> "One forensic expert (Stoney) contends that there are no standards; there are no minimum point requirements. The movement away from point requirements 'is not based on scientific study. (Epstein)' and there is disparity in the field regarding the use of level 3 detail for id. (because of distortion) 'One dissimilarity' in two impressions is thought to be a universal standard, but if an examiner believes the prints match they explain away the difference rather than discounting the match. Verification is considered to be essential, but cases exist where no verification took place; and even verification that does take place is not independent and objective. All of this leads (Stoney and Cole) to the belief that '[t]he criteria for absolute identification in fingerprint work are subjective and ill-defined.' (Wertheim/Weekly Detail 123)"

Judge Michael was not convinced that friction ridge identification is a science under the rules of the court. Although the previous excerpt was from a dissenting opinion, Judge Michael obviously feels strongly that the friction ridge identification field has not made its case and he is in a position to influence decisions in similar cases. Perhaps James Cowger was a little overly optimistic when he wrote, "that this element of judgment exists as a necessary element of the comparison is certainly not seriously questioned (Cowger, 148)."

I could find no explanation of how this judgment is not subjective or how this subjectivity relates to friction skin identification being a true science in any of the professional friction skin comparison sources. So I took it a few steps outside the fingerprint realm to find my answers. First, I looked up the terms "subjective" and "objective." All of the dictionaries I looked at basically broke down the differences as being dependent on personal feelings (subjective) or being independent of personal feelings (objective). Fair enough. Then I looked into what makes any study a science. The most consistent litmus test seemed to be the application of the scientific method. On to looking up what exactly constitutes the scientific method. Guess what? Scientific method does not include objectivity by definition in any reputable source I could find. To me, this couldn't be a mere coincidence, but it took a little more thought to fully understand.

It finally hit me: Scientists in every field *do* use their judgment when they are applying scientific method and principles. Take medicine for instance: Doctors use their judgment every day, yet they are still *simultaneously* applying scientific methods and principles. And just because they do so does *not* make medicine an art or even any less of a science. What a concept. The judgment of a doctor is based on his or her training and experience and *this* is why it is not purely subjective and this is why medicine is a science even with the application of judgment. That is also why different friction skin examiners can both look at the same print and come up with differing amounts that they consider "sufficient." The difference is because of the differences in training and experience, *not because the science is invalid.* That simple. The problem? The texts in this field do not explain it so simply.

Mark Beck helped me to understand subjectivity versus objectivity and "sufficiency" with a very simple story. This is as good a time as any to share that story with you:

> A car runs a red light at a high rate of speed causing a fatal accident. The car speeds away from the scene.
>
> There are four witnesses to the entire incident. All four were standing on the same street corner, the same distance from the accident.
>
> The first witness is a 16-year-old high school football player. He tells the responding officer that the run vehicle was an "old, shiny red and white convertible." He doesn't know a Chevy from a Ford, knows even less about vehicle years, he doesn't know about different license plates and he did not pay attention to this one anyway.
>
> The second witness is an average 32-year-old male. He reports to the officer that the run vehicle was an older model Corvette convertible, red over white and that the vehicle had Wyoming plates, but he did not get the number.
>
> The third witness works at a Chevy dealership and is an antique car buff. He tells the cop that the vehicle was a cherry red over white 1958 Corvette convertible with Wyoming plates. He further advised that he has attended antique car shows in the Rocky Mountain Region for over 30 years and that he has only ever seen one vehicle like that and he knows the owner's name is John Smith and that he lives somewhere in Laramie, Wyoming.
>
> The fourth witness is an off-duty Wyoming State Patrol officer. She tells the responding officer that the run vehicle was a cherry red over white 1958 Corvette convertible with Wyoming plates. She also advised that she had recently checked Department of Motor Vehicle records for a similar vehicle that was involved in a separate traffic incident she was currently investigating. Her investigation to date in the other case revealed that there was only one vehicle of this make, model, year and color registered in Wyoming and that this vehicle was registered to John Smith of 123 Chestnut Ave. in Laramie, Wyoming.
>
> All four witnesses saw the *same thing* from the *same vantage point*. All four therefore had the same *objective observation* (facts is facts). All four witnesses had the *visual* information available to them to identify the run car, but only two of the witnesses had the *training and experience* to *individualize* the vehicle.

This story did more to enhance my understanding of the whole subjectivity and sufficiency argument than anything I have read or heard to date. It is a very simple way to explain what I thought was a difficult concept.

Sandra Wiese
Criminalist
Northglenn Police Department, Colorado
swiese@northglenn.org

Utah Division IAI Spring Training

The Utah Division of the International Association for Identification 2004 Spring Education Conference will be held at the Layton City Police Department Conference Room on April 22, 2004 from 8:00am to 5:00 pm. The topic is Training to Certification" and will include the following mini-sessions:

Kevin Patrick- An Overview of IAI Certification, Blood Spatter Certification, and Footwear and Tire Impression Certification.

Karen Elliott/Rob Stevens-Fingerprint Certification

Jim Lee/George Throckmorton-Questioned Documents

Russ Dean/Jeff Itami-Crime Scene Certification

A Continental breakfast will be available on site.
Cost is $15.00 and it is also a good time to renew your membership.

Layton City Police Department is located at 429 N Wasatch Drive, Layton, UT.
Take I-15 exit 332. Hope to see all of you there.

TREASURER'S CORNER

We are currently in the process of updating our records. Some of our member information is outdated and we do not have current email addresses for many. Therefore, we are asking that each of our members fill out a new application which is included on the following page. If you have not already paid your 2004 dues, they are due by April 30, 2004. Any member not paid by then will be dropped from the membership roster. Please contact your IAI treasurer at dherrera-parkin@co.slc.ut.us with any questions regarding payment. **Please make your check payable to the Utah IAI.**

Updated application and checks should be mailed to:

Salt Lake County Sheriff's Office
Crime Lab
3365 South 900 West
Salt Lake City, UT 84119
Attn: Debbie Parkin

THANK YOU!!!!

The International Association for Identification

Utah Division of I.A.I.

Chartered 1989

Please send your application and payment to:
Deborah Herrera-Parkin
Salt Lake County Sheriff's
Office-Crime Lab Unit
3365 South 900 West
South Salt Lake, UT 84119

Application for Membership

I make application for membership in the Utah Division of I.A.I. in accordance with its Constitution and By Laws and agree to be bound therewith.

I am submitting the following with this application:

1. Membership Dues: (Please check ONE) ☐$15.00 Annually ☐$200.00 Lifetime

2. Permission to allow background check.

3. Photograph of self.

Name:_____ Title:_____

Department / Agency:_____

Office Address:_____

Residence Address:_____

Send Business Mail To: ☐Office ☐Residence

Telephone: Office_____ Home_____ Cell_____

E-mail Address:_____

Have you ever been convicted of a crime? (circle one) Yes No If yes state details on separate sheets.

What charge(s): _____

Forensic Disciplines: (Indicate your primary discipline as Number 1, then other areas as 2,3, etc.)

_____**Crime Lab Specialist**	_____**Forensic Studies Student**	_____**Questioned Document Examiner**
_____**Crime Scene Specialist**	_____**Latent Print Examiner**	_____**Voice Identification**
_____**Firearms & Toolmarks Examiner**	_____**Police Photographer**	_____**Tenprint Fingerprint**
_____**Forensic Art / Police Artist**	_____**Polygraph Examiner**	_____**Other**

MEMBERSHIP APPLYING FOR:

☐Active Member: Consists of persons actively engaged in the science of forensic identification, and their Bureau or Department Heads.

☐Associate Member: Consists of all reputable persons, fully or partially engaged in any of the various phases of the science of Forensic Identification and Investigation, and who are not qualified for Active Membership, are hereby eligible to become Associate Members.

☐Student Member: Consists of all persons who are full-time college students at an accredited college with a major in a law enforcement and/or forensic science related field. To be considered a full-time student, the individual must not be a member of this Division, and must not be employed by a law enforcement agency.

Degrees and/or Honors:_____

Recommended By:_____ Member Number:_____

Signature of Applicant:_____ Date:_____

Approved By:_____ Title:_____ Membership#_____ Date Received_____ Amount Received_____

START MAKING PLANS NOW TO ATTEND!

Utah Division of the International Association for Identification
2004 Fall Education and Training Conference
Red Lion Hotel,
Salt Lake City, Utah
October 12th-14th, 2004

VISIT OUR WEBSITE AT WWW.UTAHIAI.ORG FOR UPDATED INFORMATION AS ADDITIONAL SPEAKERS AND TOPICS ARE CONFIRMED OR EMAIL GARY.JOHANSEN@SLCGOV.COM FOR ADDITIONAL INFORMATION

Seminar Topics

Kevin Patrick-Utah Bureau of Forensic Services-Blood Spatter
Roger Call-F.B.I.-Computer Analysis Response Team
Dr. Shannon Novak-University of Utah-Forensic Anthropology
Post Blast Investigations-ATF
Mike King-Crime Scene Analysis

Luncheon speakers

Salt Lake Tribune Columnist and Author Robert Kirby
SLCPD Chief Rick Dinse

Banquet speaker

Utah Attorney General Mark Shurtleff

The Bulletin Board

Please check your Division web-site www.utahiai.org

Utah Division IAI Spring Education Conference
Thursday, April 22, 2004
Layton City Police Department
429 N Wasatch Drive, Layton, UT.
Topic: Training To Certification
8:00 am-5:00 pm

Utah Crime Scene Investigators Meeting
Held monthly at various sites
Fee - - - No Charge Time - - - 1000 to 1200
Check dates, sites, and topics on-line at www.utahcrimesceneinvestigators.com

Forensic Entomology Field Training Workshop
Presented by the Utah Division of Wildlife Resources
and Salt Lake City Police Department
June 9-10, 2004
Fee - - - $150.00 prior to April 30
Limited space available
Contact: Holly Betteridge at 538-4883.

THE PATENT PRINT
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