



## *First Food Fingerprints Recovered in UK*

*By Kristy Cameron*

### Special points of interest:

- 49th Annual MOIAI Conference
- Letter from the First Vice President
- Web site issues
- NIST Guidelines
- First food fingerprints
- Jansville Man's invention changed forensic science.

Forensic scientists at the University of Abertay Dundee have recovered latent fingerprints from foods – publishing the UK's first academic paper on this subject.

Only two other studies have ever reported successfully recovering fingerprints from foods, but the research for these took place in India and Slovenia using chemical substances that are not routinely used in Britain.

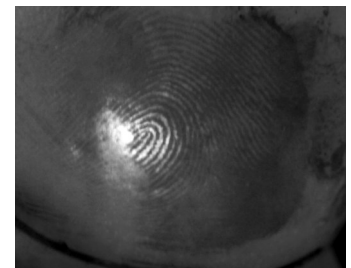
Foods are notoriously difficult surfaces to recover prints from, so are often overlooked as items of evidence.

However, by modifying an existing technique that was initially designed to recover fingerprints from the sticky side of adhesive tape, the team at Abertay have shown that this need no longer be the case. The publication of their research – in the forensic science

journal "Science & Justice" – means that others will now be able to replicate their results. Dennis Gentles, a former crime scene examiner and forensic scientist who has worked at Abertay University for the past ten years, explains why this is so significant:

"Although there are proven techniques to recover fingerprints from many different surfaces these days, there are some surfaces that remain elusive, such as feathers, human skin, and animal skin.

"Foods such as fruits and vegetables used to be in that category, because their surfaces vary so much – not just in their colour and texture, but in their porosity as well. These factors made recovering fingerprints problematic because some techniques, for example, work on porous surfaces while oth-



Fingerprint from Tomato

ers only work on non-porous surfaces.

"Using the right technique is of the utmost importance because if you use the wrong one, it can damage the print and destroy what could have been a vital piece of evidence.

"The fact that we've managed to successfully recover prints from such difficult surfaces as (See Fingerprints Page 6)

## *Janesville man's invention changed forensic science 25 years ago*

JANESVILLE — Janesville engineer and physicist Bill Hyzer was renowned for decades as a pioneer in high-speed photography.

Using cameras that seemed to magnify and even freeze time at 8,000 frames per second,

Hyzer showed scientists how a fly lands on a ceiling.

Those quirky, stop-action photographs of bullets exploding through such objects as cucumbers and soda cans? Hyzer's work.

Hyzer, 88, has poured his life into six decades of research that includes a study of how geckos cling to glass surfaces and the development of electronic switches for a lunar landing module.

(See Janesville Page 3)

## *NIST Guides Seek Interoperability for Automated Fingerprint ID Systems*

By Michael E. Newman

A new set of publications from the National Institute of Standards and Technology (NIST) could make it easier, faster, and most importantly, more reliable, for forensic examiners to match a set of fingerprints with those on file in any database, whether local, state or national.

Automated fingerprint identification systems (AFIS) allow forensic examiners to match latent prints—those left at a crime scene—against known (or exemplar) prints on file. Currently, forensic examiners must encode the distinctive features of a latent print into an AFIS to make this happen. If there are different identification systems involved—such as searches against prints stored at the local, state or national levels—the notation methods and data definitions may differ from one AFIS to the next. Examiners must re-encode each print for each new search on a different AFIS. This lack of latent print search interoperability impacts the ability to rapidly and accurately make positive identifications.

To address the problem, in 2008 NIST and the Department of Justice's National Institute of Jus-

tice (NIJ) convened the Latent Print AFIS Interoperability Working Group, a body made up of experts from state, local and federal law enforcement and forensic and information technology organizations. Based on one of the Working Group's recommendations, NIST's Law Enforcement Standards Office (OLE) partnered with NOBLIS, a nonprofit research corporation headquartered in Falls Church, Va., to facilitate implementation of the Extended Feature Set (EFS), a standard method for encoding fingerprint, palmprint or footprint features known as friction ridges regardless of what AFIS is used.

The latest result of this partnership is the issuance of three NIST Special Publications (SP) to help forensic examiners better understand and more effectively use the EFS, and provide organizations with guidance on procuring an interoperable AFIS. These are:

NIST SP-1134—Extended Feature Set Profile Specification: This guide defines EFS Profiles, sets of reference friction ridge characteristics that let examiners "triage" their search strategies so that they are appropriate to the image quality

and information content of the latent print being studied. The availability of different profiles gives examiners the flexibility to provide the AFIS with no detail (an "image only" search) all the way up to a complete input of every feature present. As a result, examiners can make effective trade-offs between encoding effort and resulting search accuracy.

NIST SP-1151—Markup Instructions for Extended Friction Ridge Features: This guide provides instructions for latent print examiners to encode a very rich set of latent ridge print information using the EFS. These instructions ensure that examiners use the same terminology, references and procedures to describe friction ridge characteristics. The common definitions are necessary for AFIS interoperability and facilitate the exchange of data between examiners.

NIST SP-1152—Latent Interoperability Transmission Specification: This guide describes the application profile language by which different AFIS can communicate with each other, define what transactions are permitted between systems, and what responses can be expected.

The EFS conforms to the ANSI/NIST-ITL 1-2011 standard\* and the FBI's Electronic Biometric Transmission Specification (EBITS).\*\*

All three publications can be downloaded via links on the Latent Print AFIS Interoperability Working Group Web page, [www.nist.gov/oles/afis\\_interoperability.cfm](http://www.nist.gov/oles/afis_interoperability.cfm).

\*Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information (ANSI/NIST-ITL 1-2011) is published in NIST SP 500-290, available at [www.nist.gov/customcf/get\\_pdf.cfm?pub\\_id=910136](http://www.nist.gov/customcf/get_pdf.cfm?pub_id=910136).

\*\* Federal Bureau of Investigation Criminal Justice Information Services Electronic Biometric Transmission Specification (FBICJIS EBITS), is available at [www.fbi Biospecs.org/ebts.html](http://www.fbi Biospecs.org/ebts.html).

Reprinted from [www.nist.gov](http://www.nist.gov).

## *Letter From the Office of the First Vice President*

Greetings,

The MOIAI Fall 49<sup>th</sup> educational conference is quickly approaching, October 11 & 12 and the Board is preparing interesting and educational topics. In addition to the educational portion of the conference, this is a time for members to get together with old friends and meet new ones.

An important aspect of the conference is the election of Officers and Board members for the coming year. At this

time, we know there will be an opening for the position of Second Vice President, but any Active or Life Active member can be nominated for any position.

This year's election is more important than most as our Division will be celebrating its Golden Anniversary in 2014. Those elected to an Officer or Board position will help guide the Division during its fiftieth anniversary and beyond. If you are interested in running for office and helping your Division, please contact a

member of the Nominating Committee at the conference. President Steve Warlen will announce the committee on Friday evening. Anyone with questions about or is interested in seeking an elected position can contact any Officer or Board member.

The Officers and Board members look forward to seeing you in October.

Kevin Bushery  
First Vice President

## Janesville from pg. 1

His data analyses of lake freeze-thaw cycles are used in international studies on global warming and climate change.

Yet perhaps Hyzer's most groundbreaking and unsung achievement was an invention he devised in a single afternoon. It also is the reason he was honored Friday by the national American Board of Forensic Odontology.

At a lunch meeting at a Holiday Inn in Freeport, Ill., in 1986, Hyzer said he listened to Kansas native Dr. Thomas Krause, an expert in forensic odontology, or "bite-mark" science, explain a conundrum to him.

At the time, criminal investigators had no tool other than the standard, one-dimensional ruler to measure and give scale to human bite marks often found on the bodies of violent crime victims. For complex reasons, the simple ruler is an unreliable tool for the job.

Hyzer sketched a solution on the spot. The two-dimensional "ABFO No. 2"—better known as the forensic bite-mark scale—was born.

The simple, L-shaped measuring tool changed Hyzer's life and forever altered forensic science and the field of crime scene investigation.

The bite mark scale's main use—a tool to help identify bodies through dental records and identify violent criminals from bite marks they leave on victims—has made Hyzer renowned.

More than 25 years since that Holiday Inn discussion, crime scene investigators in nearly

every country in the world use Hyzer's small, laminated plastic ruler while photographing everything from bite marks to tire tracks to bullet holes in walls.

Practically every crime lab and medical examiner's office in the country uses Hyzer's scale, and in most states in the U.S. the scale's use is almost a mandate.

Hyzer now is 88. To date, about three million of his bite mark scales have been sold, according to members of the American Academy of Forensic Sciences.

His scale was a simple yet ingenious solution to a decades-old problem in forensic science.

To use bite marks as crime evidence, investigators must make exact photographic records of the marks. That's done by taking pictures that include a measuring instrument laid next to the marks to show scale.

But a one-dimensional measuring tool—a simple ruler—cannot reliably give scale to photographic images because if photos are captured at even the slightest angle, uncorrectable distortion can occur.

"You needed to devise a scale that measured in two dimensions, not one," Hyzer said. "So I sat there at the Holiday Inn and sketched out the solution on a piece of paper."

The design is simple: a right-angle, two-sided ruler with circles at each of its three points. The circles are used to define and justify any measurable plane. That corrects the

problem of distortion in crime photos.

The scale also has grayscale markers, which ensure perfect photographic color reproduction.

Hyzer had done research with lizards and flies, but he had no prior expertise with human teeth or bite marks. He almost couldn't believe someone else hadn't thought of the scale already. Yet nobody had.

"It's the most thrilling feeling, like discovering an ancient cave that no one knew existed," Hyzer said.

Don Simley, a forensic odontologist in Madison who presented Hyzer with his award Friday, said bite-mark analysis has proven at times to be an ineffective way to identify criminals.

Bite-mark science has come under fire in the past after some cases in which DNA evidence later proved people were wrongly convicted based on bite-mark evidence.

But the science often helps identify bodies that have been burned beyond recognition, and Simley said use of Hyzer's scale once helped solve a case in which a young child choked to death on soap while being disciplined by a parent.

The child's bite marks were in a bar of soap at home.

Hyzer did not get rich from his invention. In fact, he never even patented it.

"It was my contribution to keeping people who didn't

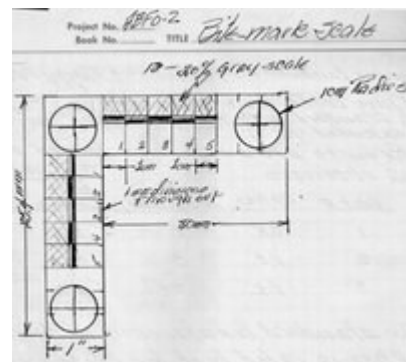


Photo by Hyzer family

A sketchbook from 1986 shows Bill Hyzer's solution to allow criminal investigators to measure and give scale to human bite marks on the bodies of victims. The resulting tool has changed forensic science and crime scene investigations. Hyzer, 88, was honored Friday by the American Board of Forensic Odontology

deserve jail out of jail, and putting people in jail who should be in jail."

Meanwhile, the scale's inventor is now down to just a few left. He's given most of his supply away to family or friends.

"I'm down to two scales now. It irks me that I'd have to go and buy one," Hyzer said.

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Photo by Hyzer family

Bill Hyzer is seen in a lab in the late 1970s working on tests of glass for eyeglasses. Hyzer was renowned for his work in high-speed photography, freezing time at 8,000 frames per second to show scientists the solutions to some mysteries.

### 49 Annual MOIAI Educational Conference Itinerary

The following is a tentative schedule for the speakers at the 49th annual educational conference. This schedule is subject to change.

To register for the 49th annual conference please visit [www.MOIAI.org](http://www.MOIAI.org) and download the conference registration form.

#### Friday October 11, 2013

- 10:00-12:30 Registration
- 12:30 -1:00 Opening Ceremony
- 1:15 – 3:00 3D Laser Scanning - Johnson Co Crime Lab
- 3:15 - 4:30 Research on FP Powders - James Eagen Midwest Research (MRI)
- 5:00 – 6:00 Business meeting (members only)

#### Saturday October 12, 2013

- 7:30 – 8:00 Registration
- 8:00 – 10:00 Video Evidence - Ann Mallot KCPD
- 10:15 -11:30 Arrowhead Forensics - RUVIS & 16 MP Camera – Parker Snedden
- 11:30 -12:45 Banquet
- 1:00 ---3:00 Stone Homicide and use of Crime Analysts in the Investigation: Jennifer Dachenhausen
- 3:15 - 4:45 Michelle Triplett's Forensic Year in Review—Presented by Kim Hardin with Missouri State Highway Patrol Crime Lab (Jefferson City)
- 4:45 –5:00 Closing Remarks – MO. IAI President Stephen C. Warlen & the newly elected president for 2013-2014.
- 5:00 - 6:00 Business Meeting (members only)

Congratulation to the winner of the 50th anniversary contest, Kyanna Cape. Ms. Cape is employed in the fingerprint section of the Missouri State Highway Patrol (Springfield). Her logo will be used on merchandise at the 50th anniversary conference.



Merchandise just for the 50th anniversary is already here. To order Polo Shirts or Challenge coins contact Editor Teresa Clerkin.

The polo shirt does come in different colors.







# Missouri Division of the International Association for Identification

49<sup>th</sup> Annual Educational Conference

October 11 – October 13, 2013

## Attendee Information:

Name: \_\_\_\_\_

Spouse/Guest: \_\_\_\_\_

Agency: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_ E-mail: \_\_\_\_\_

## Registration Costs:

(Please check all that apply. Incomplete forms will be returned)

\_\_\_\_\_ \$60 – MO IAI Member Registration                      Member #: \_\_\_\_\_

\_\_\_\_\_ \$80 – MO IAI Member Registration and 2014 Membership Dues

\_\_\_\_\_ \$80 – Non-Member Registration Fee includes New Membership

\_\_\_\_\_ \$40 – Spouse/Guest Registration

\$\_\_\_\_\_ Total                      Make checks payable to MO IAI and return completed form to:

**Kim Clarkston, Secretary**  
**P.O. Box 104822**  
**Jefferson City, MO 65110**

**Room reservations should be made directly with the Inn at Grand Glaize Located at the Lake of the Ozark Missouri.**

**Mention MOIAI to get conference room rate of \$82.00/night plus tax.**

Toll-free: 800-348-4731

Phone: 573-348-4731

Teresa Clerkin  
 MOLAI Editor  
 PO Box 104882  
 Jefferson City MO. 65110

E-Mail: [tclerkin@jeffcitymo.org](mailto:tclerkin@jeffcitymo.org)

Congratulations to those that have obtained IAI CSI Certification:

Henry Schoemehl—Ballwin Police Department

Jessica Ovca—Ballwin Police Department

Harvey Graef—St. Louis Metro Police Department

## We're on the web,

## [www.moiai.org](http://www.moiai.org)

Do you have an article that you have published? Or an idea to share to make our profession a little bit easier?

E-mail the editor your articles and ideas. They may be published in our next newsletter.

By now you have probably heard that the website; [www.moiai.org](http://www.moiai.org), was hacked. The board worked diligently during this time to confirm what information was posted on the website. We have confirmed that it was names, place of employment, address, phone number, and member number. The way it was explained to the board the hacker was using our website to send spam to individuals. Then when someone clicked on the link they got even more spam. To the best of our knowledge the hacker did not access our records. The board would like you to know that the website is back up and operational. All of the pages that you are used to seeing may not yet be available however they are being prepared to post on the website. The board would like to thank you, the members, for your patience while this matter is resolved. If you have any questions you may contact the First Vice President, Lt. Kevin Bushery, or the Editor, Teresa Clerkin.

### *Fingerprints, From Page 1*



Fingerprint on onion.

foods is another step forward in the fight against crime. It may not seem like much, but a piece of fruit might just be the only surface that has been handled in a crime scene so developing a trusted and tested technique to recover fingerprints from such surfaces is something to be valued by crime scene examiners.”

Because of the differences between the substances available in the UK and those used in the other studies, the team at Abertay began by testing a selection of the techniques currently recommended by the Home Office for recovering fingerprints.

Disappointingly, their results showed that few of these techniques – when applied to foods including apples, tomatoes, onions and potatoes – produced a print of high enough quality for it to be presented as evidence in court.

However, when they modified a substance known as Powder Suspension (PS) – a thick, tar-like substance – they found it produced a clear, high-quality mark on the smooth-surfaced food items such as the onions, apples and tomatoes.

Dennis Gentles continues: “There are about 15 techniques that are currently recommended by the Home Office for recovering prints – from a variety of surfaces – and research teams are constantly refining them and developing new ones so that the police can

get as much evidence of as high a quality as possible to help with an investigation. “Although Powder Suspension was initially developed to recover prints from the sticky side of adhesive tape, it’s since been found to work on other surfaces, so we wondered whether it would work on foods, as this was something it hadn’t been tested on before. “The smooth surface of an apple is very different from that of sticky tape though, so such a thick substance wasn’t going to produce the same results on such a different surface. So we tried altering the formulation a bit, making it more dilute than that suggested by the Home Office, and found that it out-performed all the other methods we tested. “Although there’s still a considerable amount of research to do before we can recommend techniques for all types of foods, we’ve shown for the first time that it really is possible to recover fingerprints from them – something that

was previously thought to be unachievable. This means the police will now be able to gather even more evidence to present in court, adding more weight to their investigations.”

Forensic scientists at Abertay University have made a number of forensics breakthroughs in recent years, notably recovering latent (or invisible) fingerprints from fabrics for the very first time in 2011. The University is currently offering an exciting artist-in-residency opportunity within its forensic science department, as part of the inaugural Print Festival Scotland which will run alongside the renowned Impact 8 International Printmaking Conference in Dundee this September. Further information about the residency and the two events can be found here: <http://impact.yucknyum.com/> and here: <http://www.abertay.ac.uk/about/news/newsarchive/2013/name.11473.en.html>

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