

REDACTED

DISTRICT COURT
ARAPAHOE COUNTY, COLORADO
Court Address: Arapahoe County Justice Center
7325 S. Potomac St., Centennial, CO 80112

THE PEOPLE OF THE STATE OF COLORADO vs.
Defendant:
JAMES EAGAN HOLMES

Attorney:
GEORGE H. BRAUCLER
18th Judicial District Attorney
6450 S. Revere Pkwy
Centennial, CO 80111
Phone: (720) 874-8500
Atty. Reg. #: 25910

Filed
JUN 06 2014
CLERK OF THE COMBINED COURT
ARAPAHOE COUNTY, COLORADO
COURT USE ONLY

Case Number:
12CR1522
Division/Ctrm:
201

**NOTICE OF ENDORSEMENT OF EXPERT WITNESS FOR SHRECK HEARING ON
FINGERPRINT EVIDENCE
[P-081]**

1. The court has granted a *Shreck* hearing for Motion D-107, relating to fingerprint evidence.
2. The People intend to call Ms. [REDACTED] as an expert witness at the *Shreck* hearing. The People do not intend to call Ms. [REDACTED] as a trial witness. Ms. [REDACTED] did not participate in any of the analyses in this case, and will not be called to testify as to any analysis in this case. Ms. [REDACTED] will be called to testify to explain the scientific basis of friction ridge print examination and to discuss the reliability of friction ridge print examination. Friction ridge print examination includes fingerprints, palm prints, and prints left by the friction ridges of the human foot.
3. Ms. [REDACTED] will be called to explain the underlying scientific foundation of using latent fingerprints as a means of identification, and the biological basis of friction ridge skin being unique and persistent. During fetal development, friction ridges form in a highly complex and unique arrangement and persist in that same arrangement throughout an individual's life, barring permanent injury and scarring.¹

¹ National Institute of Justice, *The Fingerprint Sourcebook* (2011). (www.nij.gov/pubs-sum/225320.htm) Chap. 2-3; Wertheim, K., & Maceo, A. (2002). *The Critical Stage of Friction Ridge and Pattern Formation*. *Journal of Forensic Identification* 52(1): 35-85

4. She will discuss in general how when the hand comes into contact with an object, the impression of friction ridge skin can be transferred to an item, and that those impressions are compared. Latent print comparisons are guided by the Analysis, Comparison, and Evaluation (ACE²) process, which includes both a qualitative and quantitative assessment of the friction ridge impressions.³
5. She will discuss how forensic fingerprint examiners have been tested and how it has been shown that they can accurately and reliably compare fingerprints.⁴
6. She will discuss the development of statistical models in the latent print discipline and how this research is ongoing in an attempt to establish a statistical model to add weight and support to an examiners conclusion.⁵
7. Much of the testimony that she would provide is summarized in an attached document, titled "Methods, Limitations, and Interpretations."
8. A copy of [REDACTED] CV is attached.

George H. Brauchler, District Attorney

By 

Chief/Senior Deputy District Attorney
Registration No. 18939

² ACE is commonly known as ACE-V (verification). Verification is the independent application of ACE to a friction ridge impression by another qualified examiner.

³ Ashbaugh, D.R. Quantitative-Qualitative Friction Ridge Analysis CRC Press, Boca Raton, Florida (1999); FBI Laboratory Latent Print Operations Manual Examining Friction Ridge Prints, Issue Date: 5/24/11, Revision 5; SWGFAST Standards for Examining Friction Ridge Impressions and Resulting Conclusions (Latent/Tenprint), Ver. 2.0, Issue Date 03/13/13 (<http://www.swgfast.org/Documents.html>); Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach (www.nist.gov/oles/).

⁴ Ulery, B.T.; Hicklin, R.A.; Buscaglia, J.; and Roberts, M.A. (2011). Accuracy and Reliability of Forensic Latent Fingerprint Decisions. *Proceedings of the National Academy of Sciences* 108(19): 7733-7738, Appendices 1-26; Tangen, J.M.; Thompson, M.B.; and McCarthy, D.J. (2011). Identifying Fingerprint Expertise. *Psychological Science* 22(8): 995-997; Langenburg, G. (2009). A Performance Study of the ACE-V Process: A Pilot Study to Measure the Accuracy, Precision, Reproducibility, Repeatability, and Biasability of Conclusions Resulting from the ACE-V Process. *Journal of Forensic Identification* 59(2): 219-257; Ulery, B.T.; Hicklin, R.A.; Buscaglia, J.; and Roberts, M.A. (2012). Repeatability and Reproducibility of Decisions by Latent Fingerprint Examiners. *PLoS ONE* 7(3): e32800. doi:10.1371/journal.pone.0032800.


⁵ Neumann, C. et al. (2012). Quantifying the weight of evidence from a forensic fingerprint comparison: a new paradigm. *Journal of the Royal Statistical Society* 175, Part 2, pp. 371-415; Neumann, C.; Champod, C.; Yoo, M.; Genessay, T.; and Langenburg, G. (2103). Improving the Understanding and the Reliability of the Concept of "Sufficiency" in Friction Ridge Examination. NIJ Report (Award 2010-DN-BX-K267).

CERTIFICATE OF MAILING

I hereby certify that I have deposited a true and correct copy of the foregoing in the Public Defender's Mailbox located at 6450 S. Revere Pkwy. Centennial, CO 80111, addressed to:

TAMARA BRADY, ESQ.
DANIEL KING, ESQ.
OFFICE OF THE PUBLIC DEFENDER

Dated: 6/6/14

By: 

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**NOTICE OF ENDORSEMENT OF EXPERT WITNESS FOR *SHRECK* HEARING ON
FINGERPRINT EVIDENCE
[P-81]**

The Court, being fully advised, hereby accepts the People's notice of endorsement.

Dated this _____ day of _____, 2014

BY THE COURT

District Court Judge Carlos A. Samour

Appendix A: Methods, Limitations, and Interpretations

Friction ridge skin consists of ridges, which are raised portions of skin, and furrows, which are the valleys in between the ridges. Friction ridge skin is found on the fingers, palms, and soles of the feet. A friction ridge print is a transfer of the ridge arrangements from the friction ridge skin onto an item. Items of evidence submitted to the Latent Print Operations Unit for examination may be examined visually, examined with various light sources, and processed with chemicals and powders to detect the presence of friction ridge prints. The specific sequence of examinations and processes depends upon the nature of the evidence.

Friction ridge print examinations are conducted using Analysis, Comparison, and Evaluation (ACE) (1), which includes an assessment of the quantity and quality of the information present. The steps of ACE are applied to friction ridge prints as appropriate.

Analysis is the assessment of a friction ridge print by a qualified examiner, accounting for the quantity and quality of the features detected in the print. An examiner will assess the types of features and the spatial relationships of the features to one another, which may be affected by factors such as pressure and movement when the print is transferred (2) (3). The print is deemed to be of value when the examiner determines that sufficient reliable information is present, such that, when compared to another print from the corresponding area of the same source, an identification decision can be reached. A thorough analysis is conducted on friction ridge prints prior to conducting comparisons. Analysis is documented by marking observed information in accordance with the Latent Print Operations Unit's standard operating procedures (4).

Comparison is the direct side-by-side observation of friction ridge prints of value to determine whether the information observed during Analysis is in disagreement or agreement between two prints. When determining if features correspond, an examiner accounts for variation in the appearance of the friction ridge prints due to factors such as pressure and movement (2).

Evaluation is the formation of a conclusion based on the examiner's observations, assessments, and documentation generated during the analysis and comparison of the friction ridge prints. Decisions that may be reached are as follows:

- Identification is the determination that two friction ridge prints originated from the same source because there is sufficient quality and quantity of corresponding information. While an identification to the exclusion of all others is not supported by research, studies have shown that as more reliable features are found in agreement, it becomes less likely to find that same arrangement of features in a print from another source (5).
- Exclusion is the determination that two friction ridge prints did not originate from the same source because there is sufficient quality and quantity of information in disagreement.

- Inconclusive is the determination that an identification or exclusion decision cannot be reached because the corresponding area in the known friction ridge print is absent or unreliable.

While the examination process is subjective in nature (6), the Latent Print Operations Unit has quality assurance measures in place to minimize variability and reduce the chance of error. Examples include but are not limited to verification and blind verification, which are implemented in accordance with the Latent Print Operations Unit's standard operating procedures (4) (8).

- Verification is the independent application of ACE to a friction ridge print by another qualified examiner.
- Blind verification is the independent application of ACE to a friction ridge print by another qualified examiner with limited awareness of the details of the case and no knowledge of the conclusion of the primary examiner.

There is no meaningful predictive rate of error for the entire comparison process (9) (10); however, recent studies have demonstrated that examiners reach accurate and reliable conclusions under specific test conditions (7) (11) (12).

The presence of a friction ridge print on an item of evidence indicates contact was made between the source and the item. The presence of a friction ridge print alone does not necessarily indicate the significance of the contact or the time frame during which the contact occurred.

Due to a variety of factors, the recovery of friction ridge prints on items of evidence is not always successful. A lack of friction ridge prints on an item or the exclusion of a friction ridge print from a given source does not necessarily mean that the given source did not come into contact with the item.

References:

1. Ashbaugh, D. R. *Quantitative and Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology*; CRC Press: New York, 1999.
2. SWGFAST. *Standards for Examining Friction Ridge Impressions and Resulting Conclusions - Latent/Tenprint*. Scientific Working Group on Friction Ridge Analysis, Study and Technology. [Online] November 24, 2011. <http://www.swgfast.org/Documents.html>.
3. Maceo, A. Qualitative Assessment of Skin Deformation: A Pilot Study. *Journal of Forensic Identification* (2009) 59 (4), 390-440.
4. FBI Laboratory Latent Print Operations Manual. Standard Operating Procedures for Examining Friction Ridge Prints. Quantico, Virginia.
5. Neumann, C.; Evett, I.W.; and Skerrett, J. Quantifying the Weight of Evidence from a Forensic Fingerprint Comparison: A New Paradigm. *Journal of the Royal Statistical Society* (2012) 175, Part 2, 371-415.

6. Ulery, B.T.; Hicklin, A.R.; Buscaglia, J.; and Roberts, M.A. Repeatability and Reproducibility of Decisions by Latent Fingerprint Examiners. (2012) PLoS ONE 7(3), e32800. doi:10.1371/journal.pone.0032800.
7. Langenburg, G. A Performance Study of the ACE-V Process: A Pilot Study to Measure the Accuracy, Precision, Reproducibility, Repeatability, and Biasability of Conclusions Resulting from the ACE-V Process. *Journal of Forensic Identification* (2009) 59(2), 219-257.
8. FBI Laboratory Latent Print Unit Quality Assurance Manual. Standard Operating Procedures for Blind Verification. Quantico, Virginia.
9. Budowle, B. et al. A Perspective on Errors, Bias, and Interpretation in the Forensic Sciences and Direction for Continuing Advancement. *Journal of Forensic Sciences* (2009) 54 (4), 798-809.
10. Gutowski, S. Error Rates in Fingerprint Examination: The View in 2006. *The Forensic Bulletin* (Autumn 2006) 18-19.
11. Tangen, J.M.; Thompson, M.B.; and McCarthy, D.J. Identifying Fingerprint Expertise. *Psychological Science* (2011) 22 (8), 995-997.
12. Ulery, B.T.; Hicklin, A.R.; Buscaglia, J.; and Roberts, M.A. Accuracy and Reliability of Forensic Latent Fingerprint Decisions. *Proceedings of the National Academy of Sciences* (2011) 108 (19), 7733-7738.



██████████, MFS

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PROFESSIONAL EXPERIENCE

Physical Scientist / Forensic Examiner

May 2000 – Present FBI Laboratory – Latent Print Operations Unit

Examine evidence for latent prints and compare those latent prints with the prints of known individuals.

Have been qualified as an expert witness in the discipline of latent prints and testified in Federal and State court.

EDUCATION

The George Washington University

Aug 1995 – Jan 1997 Washington, DC Master of Forensic Sciences Degree (MFS)

University of California, Los Angeles

Aug 1990 – June 1994 Los Angeles, CA Bachelor of Science Degree (BS) in Psychobiology

PROFESSIONAL ORGANIZATIONS & WORKING GROUPS

Working Group on Presenting Forensic Science Evidence Using Quantitative and Qualitative Terms (QQWG)

2013 – Present Member

American Society of Crime Laboratory Directors/Laboratory Accreditation Board

2012 – Present Certified Technical Assessor – Latent Prints

Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST)

2012 – Present Chair
2007 – Present Member

International Association for Identification (IAI)

2012 – Present Latent Print Identification Standing Committee, Chair
2010 – Present Latent Print Identification Standing Committee, Member
2007 – Present Member

Chesapeake Bay Division of the International Association for Identification

2001 – Present Member

National Science and Technology Council (NSTC) Subcommittee on Forensic Science Interagency Working Group on Outreach and Communication

2009 – 2012 Member

National Institute of Justice (NIJ)/National Institute of Standards and Technology (NIST) Expert Working Group on Human Factors in Latent Print Analysis

2008 – 2012 Member

PROFESSIONAL TRAINING RECEIVED

Cognitive Factors in Making Forensic Comparisons

Apr 2014 Quantico, VA

Defense Perspective on Latent Print Testimony

Apr 2013 Quantico, VA

Fundamental Concepts in the Vision and Cognitive Sciences

May 2012 Quantico, VA

Evidentiary Law Perspective on the Scientific Foundation of Fingerprint Testimony seminar

Apr 2012 Quantico, VA

IAI International Educational Conference, International Association for Identification

Aug 2013 Providence, RI
Jul 2012 Phoenix, AZ
Aug 2011 Milwaukee, WI
Jul 2010 Spokane, WA
Aug 2009 Tampa, FL
Aug 2008 Louisville, KY
Aug 2004 St. Louis, MO

AAFS Annual Scientific Meeting, American Academy of Forensic Sciences

Feb 2013 Washington, DC
Feb 2011 Chicago, IL
Feb 2008 Washington, DC

Litigating Forensic Evidence in New York Courts

Oct 2010 New York, NY

NIJ Impression and Pattern Evidence Symposium

Aug 2012 Clearwater, FL
Aug 2010 Clearwater, FL

ASCLD/LAB-International Assessor Training, American Society of Crime Laboratory Directors/Laboratory Accreditation Board

Jul 2009 Dumfries, VA

Fingerprints and Probabilities

Jul 2009 Nokesville, VA

A System Safety Approach to Managing Human Factors (HFACS/HFIX)

Jun 2009 Las Vegas, NV

Statistics, Ridgeology and ACE-V

Apr – May 2009 Minneapolis, MN

CBD-IAI Educational Conference, Chesapeake Bay Division – International Association for Identification

Nov 2012 Gettysburg, PA
Mar 2009 Virginia Beach, VA
Apr 2008 Morgantown, WV
Nov 2007 York, PA
Mar 2007 Cumberland, MD

Basic Instructor Development

Jun 2007 Quantico, VA

PROFESSIONAL TRAINING RECEIVED (continued)

Advanced Palm Print Comparison Techniques

Jun 2006 Quantico, VA

Basic Forensic Ridgeology

Oct 2005 Quantico, VA

Prenatal Origins of Human Variation in Friction Ridges

Sep 2005 Quantico, VA

Advanced Forensic Digital Image Processing Training

Aug 2005 Quantico, VA

Forensic Digital Image Processing Training

June 2004 Quantico, VA

Physiology of Friction Ridge Skin Presentation

Feb 2003 Quantico, VA

Latent Print Physical Scientist/Forensic Examiner Training Program, Federal Bureau of Investigation

Sep 2000 – July 2002 Washington, DC

PROFESSIONAL TRAINING & PRESENTATIONS PROVIDED

Latent Print Advanced Testimony Workshops

Nov 2007 – Present Various locations

Recent Trends in Fingerprint Evidence and Latent Print Daubert Testimony related presentations

Mar 2007 – Present Various locations

SWGFAST poster presentation, American Society of Crime Laboratory Directors Symposium

Sep 2011 Denver, CO

Sep 2009 Anaheim, CA

Process Mapping as a Valuable Technique for Understanding Activities that Pose the Greatest Risk for Errors presentation

Jul 2010 – Oct 2012 Various locations

Postmortem Fingerprint Techniques, Armed Forces Institute of Pathology Pathologists

July 2007 Quantico, VA

Mentor for Latent Print Physical Scientist/Forensic Examiner Training Program, Federal Bureau of Investigation

May 2005 – Oct 2012 Various classes

Cyanoacrylate Fuming, RAM, Alternate Dye Stains, Blood Processes, Taiwanese Nationals

Mar 2005 Quantico, VA

Latent Print Unit Overview, Recording Major Case Prints, and Powdering/Lifting Techniques (New Agents)

Dec 2004 – Dec 2007 Quantico, VA

Various Latent Print Processing Methods (Physical Scientist Training Program)

Jul 2004 – Jan 2006 Quantico, VA

PUBLICATIONS

Expert Working Group on Human Factors in Latent Print Analysis. (2012). *Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach*. U.S. Department of Commerce, National Institute of Standards and Technology.

Peterson, P.E.; Dreyfus, C.B.; ██████████; Hollars, M.; Roberts, M.A.; Ruth, R.M.; Webster, H.M.; and Soltis, G.L. (2009). Latent Prints: A Perspective on the State of the Science. *Forensic Science Communications* 11(4).