

STATE OF WISCONSIN : CIRCUIT COURT : MANITOWOC COUNTY

STATE OF WISCONSIN,)	
)	
Plaintiff,)	
)	Case No. 05-CF-381
v.)	
)	Honorable Judge Angela Sutkiewicz,
STEVEN A. AVERY,)	Judge Presiding
)	
Defendant.)	

AFFIDAVIT OF LUCIEN C. HAAG

Now comes your affiant, Lucien C. “Luke” Haag, and under oath hereby states as follows:

1. I am of legal majority and can truthfully and competently testify to the matters contained herein based upon my personal knowledge. The factual statements herein are true and correct to the best of my knowledge, information, and belief. I am of sound mind and I am not taking any medication nor have I ingested any alcohol that would impair my memory of the facts stated in this affidavit.

2. I am an independent forensic consultant with my own company, Forensic Science Services, Inc., in Carefree, Arizona. I have consulted as an expert and testified as an expert witness on the subject of firearms identification, firearms-related evidence, and the reconstructive aspects of shooting incidents in numerous cases across the United States and in other countries. I have also authored and presented more than 200 scientific papers, most of which address various exterior and terminal ballistic properties and the effects and behavior of projectiles. A current copy of my curriculum vitae is attached to this declaration as **Exhibit A**.



3. I published an article in the AFTE Journal (Volume 44, Number 2, Spring 2012) regarding the forensic value of bone particles recovered from bullets. A copy of that article is attached to this declaration as **Exhibit B**.

4. I was retained by Kathleen T. Zellner & Associates, P.C., to assist with the post-conviction investigation in the above-captioned case.

5. I was asked to review information and provide consultation and expert opinions regarding the ballistics evidence in that case.

6. Kathleen T. Zellner & Associates, P.C., provided me with documents relevant to the case, including transcripts of testimony, computer generated images, and photographs.

7. Based on the information I have reviewed, and past testing which I have carried out, it is my opinion, to a reasonable degree of certainty in the field of forensic ballistics, that the damaged bullet recovered from Steven Avery's garage and purported to yield a full DNA profile of Teresa Halbach ("Ms. Halbach") (Wisconsin State Crime Lab Item FL) shows no evidence of having been shot through Ms. Halbach's skull. The bullet, which was identified as a .22 long rifle bullet, was comprised of such soft metal that there would be detectable bone fragments embedded in the damaged bullet if it had been fired through Ms. Halbach's skull. Because no bone fragments have been identified in the damaged bullet, Item FL, over the course of its examination — including DNA and firearms/toolmarks analysis — at the Wisconsin State Crime Lab, it is my opinion, to a reasonable degree of certainty in the field of ballistics, that Item FL was not fired through Ms. Halbach's skull.


8. I carried out tests to illustrate that bone fragments would become embedded in .22 long rifle bullets when fired through bone. I fired two (2) copper-plated, lead, CCI Minimag® .22 long rifle bullets through approximately 2mm thick flat bone and into a soft tissue simulant

from which it was recovered. I fired two (2) additional copper-plated, lead, CCI Minimag® .22 long rifle bullets through one layer of approximately 2mm thick flat bone, then through 5 inches of soft tissue simulant, and through a final section of approximately 2mm thick flat bone, and finally into a soft tissue simulant as a means of recovering the bullet. Bone particles, embedded in the soft lead, were readily visible under a stereo-microscope for both the bullets fired through one thickness of bone and two thicknesses of bone. A copy of the experimental design of this demonstration, along with diagrams and photos, is attached to this declaration as **Exhibit C**. This demonstration supports my opinion that, to a reasonable degree of certainty in the field of forensic ballistics, item FL was not fired through Ms. Halbach's skull because there were no bone particles embedded in it when it was examined by Wisconsin State Crime Lab analysts.

9. William Newhouse ("Mr. Newhouse"), a Wisconsin State Crime Lab firearms examiner, analyzed the damaged bullet, item FL, using a microscope. According to Mr. Newhouse's bullet worksheet, attached to this declaration as **Exhibit D**, Mr. Newhouse identified no trace evidence on the damaged bullet. If there were bone fragments embedded in the damaged bullet, I would expect a reasonably competent firearms examiner to have identified them during their microscopical examination. Based upon my review of Mr. Newhouse's trial testimony, it is my opinion that Mr. Newhouse is a reasonably competent firearms examiner who would likely have identified bone fragments embedded in the damaged bullet had they been present. Because Mr. Newhouse did not note or describe any bone or bone-like particles embedded in item FL during his microscopical examination of this damaged bullet, it is my opinion, to a reasonable degree of certainty in the field of forensic ballistics, that item FL was not fired through Ms. Halbach's skull.

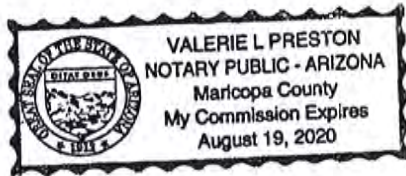
10. A definitive resolution and statement regarding the absence of bone particles in the item FL damaged bullet would require a detailed examination for such particles under a suitable optical microscope, or an examination by a qualified operator of a scanning electron microscope (SEM) equipped with an energy dispersive x-ray analyzer (EDS) who is experienced in the recognition and identification of bone particles in bullets. It is my understanding that Dr. Christopher Palenik, PhD, of Microtrace, LLC, has conducted an examination of the damaged bullet. I have been informed by Ms. Zellner that no bone was detected on the bullet, which confirms my opinions stated above. I also examined the photographs taken by Dr. Palenik of the damaged bullet and have confirmed that no bone fragments were visible in these photographs.

FURTHER AFFIANT SAYETH NAUGHT


Lucien C. Haag

Subscribed and sworn before me
this 26 day of MAY, 2017.


Notary Public



BIOGRAPHICAL INFORMATION

Lucien C. "Luke" Haag is a former Criminalist and Technical Director of the Phoenix Crime Laboratory, with over 50 years experience in the field of criminalistics and forensic firearms examination.

He is the author of the 1st edition of the book, **Shooting Incident Reconstruction**, Elsevier/Academic Press, 2005 ISBN # 0-12-088473-9 and co-author of the 2nd edition (Elsevier/Academic Press, 2011).

Presently he is an independent forensic consultant with his own company, Forensic Science Services, Inc., that provides criminalistic services to prosecutors, public defenders, private attorneys, law enforcement agencies, insurance companies, educational institutions and private individuals.

Luke Haag has a Bachelor of Science degree in chemistry from the University of California at Berkeley with subsequent forensic training at California State University at Long Beach, Indiana University, Arizona State University, the FBI Laboratory, the FBI Forensic Training Facility and course work in Forensic Microscopy from the McCrone Institute.

In addition to Distinguished Membership status in the Association of Firearm and Toolmark Examiners and the California Association of Criminalists, he is a member of the Southwest Association of Forensic Scientists, The American Academy of Forensic Sciences, an Associate Member of the ENFSI and past board member of the International Wound Ballistics Association.

He has authored and presented over 200 scientific papers, most of which have dealt with various exterior and terminal ballistic properties, effects and behavior of projectiles. His primary area of special interest is the reconstruction of shooting scenes and incidents.

Past service in the Association of Firearms and Toolmark Examiners has included the Scientific Advancement Committee (1978-1980), Board of Directors (1980-1981), Program Chairman (1981), Board of Admissions (1983-1984), 2nd Vice-President (1983-1984), 1st Vice-President (1984-1985) and President of the Association (1985-1986), Instructor in Shooting Reconstruction workshops and classes for AFTE in 1994 and 1995, the California Department of Justice in 1995 and 1998, the California Association of Criminalists in 1996 and 1997, the Arizona Homicide Investigators Association in 2000, 2004, 2005 and 2007 and

multiple locations (California, Georgia, Oregon, Switzerland, England).

LUCIEN C. HAAG

Criminalist/Firearms Examiner

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PERSONAL DATA _____

Place of Birth: Springfield, Illinois, USA

Date of Birth: July 15, 1940

EDUCATION _____

UNIVERSITY OF CALIFORNIA at Berkeley: Bachelor of Science in Chemistry (1963)

CALIFORNIA STATE COLLEGE at LONG BEACH:

Criminalistics I and II

(to include basic firearms evidence and examination),

Questioned Documents Examination, Clinical Chemistry, Math (1963-1965)

ARIZONA STATE UNIVERSITY at TEMPE: Absorption Spectroscopy course (1966)

Criminal Law, Criminology, Statistics and other Criminal Justice courses (1978-1982)

SPECIAL FORENSIC TRAINING PROGRAMS _____

McCrone Research Institute Polarized Light Microscopy and Forensic Soil Examination

FBI Forensic Training Center: Criminalistic Laboratory Information System/

General Rifling Characteristics

Program

Shooting Reconstruction Seminar-1996

Association of Firearm and Toolmark Examiners: Annual Training Seminars

(over 30 training seminars from 1974 to

present)

Metallurgy for the Non-Metallurgist 2015

LICENSES/CERTIFICATES _____

Certified Instructor in Criminalistics (Arizona Board of Directors of Community Colleges)

Certified Criminalist (California Association of Criminalists)

Federal Firearms License #9-86-007-01-OD-37865

Written Certification Examinations, AFTE, Firearms Examination & Gunshot Residue

PROFESSIONAL MEMBERSHIPS _____

Southwest Association of Forensic Scientists

California Association of Criminalists

American Academy of Forensic Sciences

Forensic Science Society of Great Britain

Association of Firearm and Toolmark Examiners

CITATIONS/AWARDS

- Distinguished Member: Association of Firearm and Toolmark Examiners (1976)
- Distinguished Member Award: California Association of Criminalists (1988)
- Key Member Award: Association of Firearm and Toolmark Examiners (1978)
- Key Member Award: Association of Firearm and Toolmark Examiners (1979)
- Best Technical Presentation Award: Spring 1986, California Association of Criminalists, for
"The Measurement of Bullet Deflection by Intervening Objects and
the Study of Bullet Behavior after Impact"
- Best Technical Presentation Award: Fall 1987, California Association of Criminalists, for
"Projectile Induced Mechanical & Thermal Effects in
Fibers"
- Best Technical Presentation Award: Spring 1989, California Association of Criminalists, for
"American Lead-, Barium-, and Antimony-Free Centerfire Ammunition"
- Key Member Award: Association of Firearm and Toolmark Examiners (1992)
- Best Technical Presentation Award: Spring 1996, California Association of Criminalists, for
"A Shot from Afar?"
- Best Technical Presentation Award: Fall 1996, FBI Shooting Scene Reconstruction Seminar for
"Bullet Perforation of Sheet Metal"
- Alfred Biasotti Award - Fall 1998 CAC Seminar
(Exterior, Terminal, Wound Ballistics of Frangible Ammunition)
- Roger S. Greene III Memorial Award, CAC May 2000
- Best Technical Presentation Award: Spring 2000, California Association of Criminalists, for
"Contemporary Russian 7.62x39mm Ammunition"
- Calvin Goddard Award – AFTE 2012

PROFESSIONAL OFFICES/SERVICE

- California Association of Criminalists: Recording
Secretary,
Board of Directors, Ethics Committee, Certification Board of Examiners
- Association of Firearm and Toolmark Examiners: Board of Directors, Board of Admissions,
Scientific Advancement Committee, 2nd Vice-President ('83-84),
1st Vice-President ('84-85), President ('85-86), Certification Committee
- American Academy of Forensic Sciences: Delegate to the Soviet Union,
1988
- Forensic Science Delegate to the Soviet Union, 1990
Member-AFTE Editorial Review Panel
Member-Board of Editors- Am. Jour. of For. Med. & Path.

PROFESSIONAL EXPERIENCE

- Criminalist/Supervising Criminalist, Phoenix Police Crime Laboratory (June 1965-March 1982)
- Criminalistics Instructor, Phoenix College/Central Arizona College (1968-1979)
- President: Forensic Science Services, Inc.
(1982-present)

SUMMARY OF EXPERIENCE AND ACTIVITIES

Lucien C. (Luke) Haag has been providing criminalistic services to prosecutors, public defenders, private attorneys, law enforcement agencies, insurance companies, educational institutions, the military and the firearms and ammunition manufacturing industry for over 35 years. He is also a frequent speaker at legal, judicial and law enforcement conferences and seminars throughout the United States. (See attached list of publications and presentations.)

COURT EXPERIENCE

Lucien C. Haag has qualified and testified as an expert witness on the subject of firearms identification, firearms-related evidence and the reconstructive aspects of shooting incidents in both the United States Federal Courts and state courts. States in which such testimony has been given include Alabama, Alaska, Arizona, California, Connecticut, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Louisiana, Massachusetts, Michigan, Missouri, Montana, Nevada, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Virginia, Washington and West Virginia. He has also testified on behalf of the Crown in Canada and Northern Ireland.

LUCIEN C. HAAG Criminalist/Firearms Examiner

PRESENTATIONS/PUBLICATIONS

"Bullet Ricochet: An Empirical Study and Device for Measuring Ricochet Angle"
AFTE Journal, 7:3 (December 1975)

"The Use of Ballistics Calculations in the Solution of a Crime"
AFTE Journal, 8:4 (1976)

"Heckler & Koch Polygonal Rifling"
AFTE Journal, 9:2 (1977)

"Class Characteristics of Rifled Barrels"
AFTE Journal, 10:2 (1978)

"Firearms Evidence-Field Expedient Determinations"
**I.N.F.O.R.M. Western Conference on Civil and Criminal Problems
Wichita, KS (May 1977)**

"Shotgun Evidence"
AFTE Journal, 10:3 (1978)

"Shotgun Ballistics"
1978 Training Monograph for Police Investigators

"The Forensic Use of Exterior Ballistics Calculations"
AFTE Journal, 11:1 (1979)

"Bullet Ricochet from Water"
AFTE Journal, 11:3 (1979)

"Sound Spectrographic Characterization of Gunshots"
AFTE Journal, 11:3 (1979)

"An Unusual Interior Ballistic Phenomena"
AFTE Journal, 11:4 (1979)

*"The Unwinding of Rifling Engravings through Rotational Deceleration
During Penetrative Impact"*
AFTE Journal, 12:2 (1980)

"The Characterization of Propellant Types through the Examination of Fired Bullets"

AFTE Journal, 12:2 (1980)

"The Identification of Percussion Caps"
AFTE Training Seminar, Kansas City, MO (1980)

*"The Analysis and Comparison of Smokeless Propellants by
Reverse-Phase High Performance Liquid Chromatography"*
Fall 1980 CAC Seminar

"Bullet Impact Spalls in Frangible Surfaces"
AFTE Journal, 12:4 (1980)

"Class Characteristics of Smokeless Propellants"
AFTE Seminar, Denver, CO (1981)

**Lucien C. Haag
Presentations/Publications 2**

"Geometric Aspects of Shotgun Patterns on Various Surfaces"
Video Training Tape

"Thermal Effects on Ammunition Stored at High Ambient Temperatures"
AFTE Journal, 14:1 (1982)

"Exterior and Terminal Shotgun Ballistics"
AFTE Seminar, Orlando, FL (1982)

"The Exterior and Terminal Ballistic Properties of Shotgun Pellets"
Inter-American Congress of Forensic Sciences/CAC Seminar (1982)

"A Microchemical Test for Copper-Containing Bullet Wipings"
AFTE Journal, 13:3 (1981)

"Double 00-Buck"
AFTE Journal, 13:3 (1981)

"Firearms Evidence for Police Officers"
**(1st Edition) Seminar: Central Arizona College (1978)
Arizona Homicide Investigators Association Seminars (1982)**

"Forensic Ballistics - An Illustrated Overview"
APAAC Seminar (1982)

"A Novel Means of Propellant Identification in a Shooting Mishap"
AFTE Seminar, San Mateo, CA (1983) and AFTE Journal, 15:4 (1983)

"The Class Characteristics of Six New Canister Propellants from the Accurate Powder Company"
CAC Seminar (1984)

"Shooting Incident Reconstruction"
**2-day Seminar for the Northeast Multi Regional Training Organization
Aurora, IL (October 1984)**

"Firearms Evidence for Police Officers"
(2nd Edition) Iowa Chapter-International Association for Identification

Training Seminar, Des Moines, IA (May 1985)

"Differentiating Firearms-Related Accidental Deaths and Suicides"
American Academy of Forensic Sciences Seminar, Las Vegas, NV (1985)

*"Accident, Suicide or Murder:
An Integrated Approach to the Investigation of Death by Firearms"*
CAC Seminar, Oakland, CA (1985)

"Some Typical Fields of View for Optical Sights"
AFTE Journal, 17:2 (April 1985)

"Shooting Reconstructions"
Association of Firearms and Toolmark Examiners Training Seminar, Lansing, MI (1985)
Arizona Homicide Investigators Association Seminar, Flagstaff, AZ (1985)

**Lucien C. Haag
Presentations/Publications 3**

*The Construction of a Small Portable Laser and its Use
in External and Terminal Ballistic Measurements"*
AFTE Training Seminar, Baltimore, MD(1986) and AFTE Journal, 19:2 (1987)

*"The Measurement of Bullet Deflection by Intervening Objects
and the Study of Bullet Behavior After Impact"*
**AFTE Training Seminar, Baltimore, MD (1986) and AFTE Journal, 19:4 (1987);
also presented at Spring CAC Seminar (1986)**

"Firearms Evidence for Attorneys"
Arizona Prosecuting Attorneys Advisory Council, Scottsdale, AZ (1986)

"Firearms Evidence for Police Officers/Shooting Reconstructions"
Mesa, AZ, Police Department Training Program (February 1987)

Computer Workshop-Ballistics Programs
American Academy of Forensic Sciences Meeting, San Diego, CA (1987)

"Ballistics Programs for Personal Computers: Capabilities and Application to Forensic Problems"
**Combined CAC/NWAFS Seminar, Reno, NV (May 1987);
also given at AFTE Training Seminar, Seattle, WA (1987)**

"An Adjustable Shooting Platform for Use in Ricochet Studies"
AFTE Seminar, Seattle, WA (June 1987)

"Shooting Reconstruction Training Program"
Arizona Department of Public Safety, Phoenix, AZ (September 1987)

"Shooting Reconstruction and Scene Investigations"
International Association of Law Enforcement Firearms Instructors (September 1987)

"Class Characteristic Differences in the Same Box of .22's"
AFTE Journal, 19:3 (July 1987)

"Projectile-Induced Mechanical and Thermal Effects in Fibers"

CAC Seminar (October 1987), AFTE Training Seminar (1989), SWAFS Seminar (1996)

"The Measurement of Bullet Deflection by Intervening Objects and in the Study of Bullet Behavior After Impact"

CAC Newsletter (January 1988)

"Firearms Evidence for Attorneys"

Northwestern University Law School, Chicago, IL (August 1988)

"Firearms Evidence for Pathologists"

Armed Forces Institute of Pathology Training Program, Bethesda, MD (September 1988)

"Shooting Reconstructions and Crime Scene Procedures"

Special Panel presentation for the CAC Seminar (October 1988)

"Firearms Evidence for Police Investigators/Shooting Reconstructions"

DPS/AZ Law Enforcement Training Academy, Tucson, AZ (January 1989)

**Lucien C. Haag
Presentations/Publications 4**

"Ballistic Gelatin: Controlling Variances in Preparation and a Method for the Calibration of Gelatin Blocks"

Panel Member/Presenter in Wound Ballistics Seminar, Phoenix, AZ (February 1989)

"Firearms Evidence/Shooting Reconstructions"

Northwestern Law School, Chicago, IL (March 1989 and August 1990)

"Shooting Reconstructions"

**National Homicide Seminar-California District Attorneys Association,
Costa Mesa, CA (April 1989)**

"American Lead-, Barium-, and Antimony-Free Primers"

CAC Seminar, Sacramento, CA (May 1989)

"Bullets Through Glass"

AFTE Seminar, Omaha, NE (June 1990)

"A Means for Improving the Rhodizonate Test for Lead-Containing GSR on Bloody Clothing"

CAC Seminar, San Francisco, CA (Spring 1990)

and AFTE Seminar, Omaha, NE (June 1990)

"Suggested Method for Calibration of Gelatin Blocks"

AFTE Journal, 21:3 (July 1989) pp. 483-489

"Firearms Evidence and Examination in the United States"

**Combined meeting of the All-Union Research Institute of Soviet Forensic Sciences
and the Ministry of Internal Affairs, Moscow (July 1990)**

"Shooting Scene Evaluation and Reconstruction"

Arizona Homicide Investigators Association, Flagstaff, AZ (August 1990)

"Shots in the Dark"

(A photographic technique for recording the source and nature of muzzle/cylinder gap flash from

firearms),

SWAFS Seminar, Tucson, AZ (October 1990)

"A Method for Improving the Griess and Sodium Rhodizonate Tests for GSR on Bloody Garments"
Southwestern Association of Forensic Scientists Seminar, Tucson, AZ (1990)
SWAFS Journal (April 1991)

"Vertical Ballistics"

AFTE Journal, 22:1 (January 1990)

"Powder in a Most Peculiar Place"

AFTE Journal, 22:2 (April 1990)

"Homady Knurled Bullets: Their Class Characteristics and Properties of Forensic Interest"
AFTE Journal, 22:2 (April 1990)

"Firing Pin Protrusion and Impression Depth Measurement"

AFTE Journal, 22:3 (July 1990)

Lucien C. Haag
Presentations/Publications 5

"Class Characteristic of the Colt AR-15 Conversion Kit"

AFTE Journal, 22:3 (July 1990)

"Portable Laser-Theodolite System for Use in Shooting Scene Reconstruction"

"An Inexpensive, Portable Bullet Recovery Device"

AFTE Journal, 23:1 (January 1991)

"Light and Sound as Physical Evidence"

California Association of Criminalists Seminar, San Francisco, CA (May 1991)

"The Forensic Aspects of Percussion Revolvers"

AFTE Seminar, Houston, TX (June 1991)

"Involuntary Discharge of Firearms"

AFTE Seminar, Houston, TX (June 1991)

"Contemporary Soviet Pistols and Ammunition"

AFTE Seminar, Houston, TX (June 1991)

Fingernail Striae Symposium: Panel Member and Speaker

AFTE Seminar, Houston, TX (June 1991)

"To Create a Hangfire"

AFTE Journal, 23:2 (April 1991)

*"A Method for Improving the Griess and Sodium Rhodizonate Tests
for GSR Patterns on Bloody Garments"*

AFTE Journal, 23:3 (July 1991)

"An Inexpensive Method to Assess Bullet Stability in Flight"

AFTE Journal, 23:3 (July 1991)

"Firearms Evidence: Shooting Incident Investigation"
Speaker: SW Homicide Seminar, El Paso, TX (October 1991)

180-Minute Video Production, 1991:
"Forensic Firearms Evidence: Elements of Shooting Incident Investigation"
ANITE Productions, PO Box 375, Pinole, CA 94564

*"A Shot in the Dark: A Procedure for the
Photographic Documentation of a Firearm's Muzzle Flash"*
AFTE Journal, 23:4 (October 1991)

"Newly Discovered Firearms Evidence in the Assassination of Senator Huey P. Long"
American Academy of Forensic Sciences Meeting, New Orleans, LA (February 1992)
AFTE Seminar, Miami, FL (April 1992)
CAC Fall Seminar, Ventura, CA (1992)

"Forensic Firearms Evidence"
California District Attorneys Association Meeting, Costa Mesa, CA (April 1992)
IXth National Homicide Symposium/CDA
San Francisco, CA (May 1993) and Lake Tahoe, CA (October 1993)

Lucien C. Haag
Presentations/Publications 6

"Forensic Ballistics"
3-Day Seminar-Southern Institute of Forensic Science, New Orleans, LA (April 1993)

"The Forensic Value of Various Terminal Ballistic Events"
"The Forensic Aspects of Black Powder Firearms"
AFTE Seminar, Raleigh, NC (May 1993)

"Terminal Ballistic and Trace Evidence Aspects of Firearms Evidence and Examination"
IAFS Dusseldorf, Germany (August 1993)

"The Persistence of Fingernail Striae with the Passage of Time and Following Injury"
IAFS Dusseldorf, Germany (August 1993)
California Association of Criminalists (October 1993)

".380 Automatic in the 9x18mm Makarov: Exterior and Terminal Ballistic Characteristics"
First IWBA Conference, Sacramento, CA (March 1994)
AFTE Journal, 26:4 (October 1994) and IWBA Journal, 2:1 (1995)

"9mm Parabellum in .40 S&W Pistols: Exterior and Terminal Ballistic Characteristics"
First IWBA Conference, Sacramento, CA (March 1994)
IWBA Journal, 2:1 (1995)

"Russian 7.62x39mm 'Hunting' Ammunition: Design and Performance"
First IWBA Conference, Sacramento, CA (March 1994)

*"Federal Premium .308 Winchester 168 Grain JHP-BT: A SWAT/HRT Round with Some
Idiosyncrasies"*
First IWBA Conference, Sacramento, CA (March 1994)

"Falling Bullets: Terminal Velocities and Penetration Studies"

First IWBA Conference, Sacramento, Ca (March 1994)
IWBA Journal, 2:1 (1995)

"Shotgun Barrel Shortening Effects on Pellet Pattern, Velocity and Penetration"
Paper by L. Haag and Gene Wolberg, presented by G. Wolberg
First IWBA Conference, Sacramento, CA (March 1994)

"Shooting Incident Investigation"
US Department of the Interior/National Park Service Training Seminar
Mesa Verde, CO (May 1994)

"Fire Lapping"
AFTE Training Seminar, Indianapolis, IN (June 1994)

"Transference of Class Characteristics on Bullets to the Inner Surfaces of Bullet Holes in Plastic"
AFTE Training Seminar, Indianapolis, IN (June 1994)

"First Stones"
AFTE Training Seminar, Indianapolis, IN (June 1994)

"Shooting Incident/Trajectory Workshop"
Coordinator/Speaker on Projectile Strikes on Automobiles
AFTE Training Seminar, Indianapolis, IN (June 1994)

Lucien C. Haag
Presentations/Publications 7

"Taking Aim at Firearms: Dissection of a Murder"
Arizona Attorneys for Criminal Justice Seminar (Phoenix-September 1994)

*"The Makarov Mixup:
380Automatic in the 9x18mm Makarov.Exterior and Terminal Ballistic Characteristics"*
AFTE Jour. 26:4 (Oct. 1994) pp. 276-282

"Assault Weapons": Design Characteristics and Ballistic Properties of Forensic Interest
American Academy of Forensic Sciences, Seattle, WA (February 1995)

"Hardness as a Class Characteristic of Lead Bullets and Bullet Cores"
AFTE Journal, 27:1 (Jan. 1995)

"American Lead-Free 9MM-P Cartridges"
AFTE Journal, 27:2 (April 1995)

*"An Evaluation of the Role of Rifling Twist Direction and Bullet Stability in the Deflection
and Precession for Some .30-.31 Caliber Bullets"*
AFTE 1995 Seminar, San Diego, CA

"Phenyltrihydroxyfluorone: A 'New' Reagent for Use in Gunshot Residue Testing"
AFTE 1995 Seminar, San Diego, CA
AFTE Journal, 28:1 (January 1996)

*"Hornady Vector Ammunition: A New Tool in Studying Selected
Exterior and Terminal Ballistic Events of Forensic Interest"*
AFTE 1995 Seminar, San Diego, CA
AFTE Journal, 28:1 (January 1996)

"Ballistic Wind"
AFTE 1995 Seminar, San Diego, CA

"Trajectory Analysis Workshop: Projectile Strikes to Automobiles"
(Gene Wolberg - Co-Instructor)
AFTE 1995 Seminar, San Diego, CA

1994 *"IWBA Conference Ammunition Tests"*
"BB Perforation of Fresh Pigskin over Ballistic Gelatin" pp.50-51.
IWBA Journal, 2:1 (1995)

"Firearms Trajectory Analysis" - Instructor, 3-Day Training Class
California Department of Justice
Sacramento, CA (January 29-31, 1996)

"Long Shots in Fact and Fiction"
American Academy of Forensic Sciences, Nashville, TN (February 1996)

"Trace Evidence Considerations Associated with Firearms Evidence"
Northwest Association of Forensic Scientists, Spokane, WA (April 1996)

Lucien C. Haag
Presentations/Publications 8

"A Shot from Afar?"
"Two New Black Powder Substitutes: Their Physical and Chemical Properties"
"Nitrosophthal as an Alternative to the DTO Test for the Detection of Copper in Bullet Impact Marks"
CAC Seminar, Milpitas, CA (May 1996)

"Firearms and Toolmark Evidence"
California District Attorneys Assoc. Forensic Evidence Seminar, San Diego, CA (May 1996)

"The Ballistics of Cartridge Case Ejection"
"The Siege at Ruby Ridge"
AFTE Seminar, Milwaukee, WI (July 1996)

"Bullet Penetration and Perforation of Sheet Metal"
International Association of Forensic Scientists, Tokyo, Japan (August 1996)
FBI Shooting Scene Processing & Reconstruction Seminar, Quantico, VA (September 1996)

"Return to Ruby Ridge"
"Vector Ammunition Update"
CAC Fall Seminar, Palm Springs, CA (October 1996)

"Shooting Incident/Trajectory Training Class"
Mesa Police Department, Mesa, AZ (October 22-24, 1996)

"Shooting Scene Reconstruction-Firearms Evidence"

University of California at Riverside (November 1996)

"Firearms Identification and Evidence"
CAC General Knowledge Certification Examination Preparation Class
Los Angeles, CA (December 1996)

"Firearms and Toolmark Evidence"
National Homicide Symposium XI - CDAA
Monterey, CA (May 1997)

"Shooting Reconstruction Workshop"
CAC Seminar, Sacramento, CA (May 1997)

"A Novel Silicon Rubber Extrusion Gun for Use in Toolmark and Firearms Examinations"
AFTE Journal, 29:2 (Spring 1997)

"The In-Flight Behavior and Ballistic Performance of Destabilized and Ricocheted Bullets"
"The Forensic Properties of Contemporary Frangible Ammunition"
"The Forensic Applications of Oehler's Model 43 Personal Ballistics Laboratory"
AFTE Seminar, Annapolis, MD (July 1997)

"Contemporary Issues in Forensic Firearms Identification"
American Academy of Forensic Sciences/Association of Firearms and Toolmark Examiners
University of California at Los Angeles, Los Angeles, CA (August 1997)

Lucien C. Haag
Presentations/Publications 9

"Extended Ballistic Properties of Some Law Enforcement 9mmP Cartridges"
AFTE Journal 29:3 pp. 331-345 (Summer 1997)

"Wound Ballistics of Frangible Ammunition"
"Sphere Penetration in Tissue Simulant"
"Wound Ballistics of Billy Dixon's Long Shot"
"Wound Ballistics in Fact and Fiction"
*Co-presented with Dr. Martin Fackler
1997 IWBA Conference, Manhattan Beach, CA (Oct. 4&5 1997)

"The Exterior Ballistics of Contemporary Air Guns and BB Guns"
Co-authored with Michael G. Haag
CAC News pp. 20-24 (Fall 1997)

"Bullet Impact Workshop: Characteristics and Identification"
L. Haag - Instructor
Fall 1997 CAC Seminar, Irvine, CA

"Some Forensic Aspects of Spherical Projectiles"
AFTE Journal 30:1 pp. 102-107 (Winter 1998)

"Bullet Penetration and Perforation of Sheet Metal"
AFTE Jour. 29:4 pp. 431-459 (Fall 1997)

"Firearms Evidence"

**Annual Short Course and Scientific Evidence Course
Northwestern University Law School, Chicago, IL (twice yearly, ca. 1990 through 1998)**

"Cartridge Case Ejection Patterns"
AFTE Journal 30:2 (Spring 1998), pp. 300-308

*"Romanian 'AKM' Semi-Automatic Rifles and Ammunition in 5.45x39mm:
Characteristics and Performance"*
AFTE Journal 30:3 (Summer 1998)

"Firearms Evidence and Shooting Scene Reconstruction"
Utah DPS and Forensic Science Association
Salt Lake City, Utah (April 1998)
CDAА Forensic Evidence Seminar
Newport Beach, CA (May 1998)
Arizona Homicide Investigators Association Seminar
Scottsdale, AZ (August 1998)

"The Physical and Chemical Properties of Black Powder Substitutes"
"Firearms and Toolmark Identification: Is It Really Science?"
AFTE Seminar, Tampa, FL (July 1998)

"Firearms Trajectory Analysis" - Instructor, 5-Day Training Class
California Department of Justice
Sacramento, CA (September 21-25, 1998)

Lucien C. Haag
Presentations/Publications 10

*"The Design, Composition, Exterior Ballistic-, Terminal Ballistic-, and Wound Ballistic Properties
of Contemporary Frangible Ammunition"*
CAC Fall Seminar, San Diego, CA (October 1998)
<received the Alfred A. Biasotti - Most Outstanding Presentation Award>
CAC News, Second Quarter 1999 pp. 18-27
AFTE Journal 31:3 (Winter 1999), pp.344-362

"Firearms Evidence -Shooting Reconstruction"
National Homicide Symposium XII - CDAА
Costa Mesa, CA (May 1999)

"Firearms Evidence and Shooting Scene Reconstruction"
Maricopa County Attorney's Office Advanced Trial Advocacy Course
Phoenix, AZ (June and October 1999)

"The Sound of Bullets"
*"5.56x45mm SS109/M855 Bullets:
Design, Exterior and Terminal Ballistic Performance"*
"Base Deformation as an Index of Impact Velocity for Full Metal Jacketed Rifle Bullets"
International Association of Forensic Scientists, Los Angeles, CA (August 1999)

"Shooting Scene Reconstruction"
Arizona Homicide Investigator's Association Seminar

Mesa, AZ (September 1999)

"Russian 5.56mm Ammunition"
AFTE Journal 31:4 (Fall 1999), pp. 490-492

"Rates of Fire for Some Common Semi-Automatic and Full Automatic Firearms"
SWAFS Journal 22:1 (February 2000), pp. 31-43

"Firearms Evidence -Shooting Reconstruction"
California District Attorneys Association
Monterey, CA (April 2000)

"Reference Ammunition for Gunshot Residue Testing"
CACNews Journal (Second Quarter 2000), pp. 24-29

"Firearms Evidence -Shooting Reconstruction"
Maricopa County Public Defender's Office
Phoenix, AZ (April 2000)

Shooting Incident Investigation and Reconstruction Class
Arizona Homicide Investigators Association
Glendale, AZ (April 24-25, 2000)

"Contemporary Russian 7.62x39mm Ammunition"
California Association of Criminalists Seminar
<received the *Alfred A. Biasotti - Most Outstanding Presentation Award*>
Napa, CA (May 2000)

**Lucien C. Haag
Presentations/Publications 11**

"A Rapid Non-Destructive Method for Analyzing and Comparing Bullet Lubricants"*
AFTE Journal 32:2 (Spring 2000), pp. 143-153
SWAFS Journal 23:1 (February 2001), pp. 38-52
*Co-authored with Michael G. Haag
"Drop-Fired or Fired and Dropped?"
AFTE Journal 32:2 (Spring 2000), pp. 154-157

"Firearms Evidence and Shooting Scene Reconstruction"
Maricopa County Attorney's Office Advanced Trial Advocacy Course
Phoenix, AZ (June 2000 / October 2000)

"The Enigmatic Bullet- the Case of Private Clegg, Belfast, Northern Ireland"
*"Design, Exterior and Terminal Ballistic Performance
of 5.56x45mm SS109/M855 Bullets"*
"Base Deformation as an Index of Impact Velocity for Full Metal Jacketed Rifle Bullets"
AFTE Seminar, St. Louis, MO (June 2000)

Shooting Incident Investigation and Reconstruction Class
Pima County Attorney's Office
Tucson, AZ (July 31, 2000)
Northwestern University -School of Law-Short Course

Chicago, IL (August 10, 2000)

"Contemporary Russian 7.62x39mm Ammunition"
"Bullets through Glass: Sequence and Orientation at Impact"
European Academy of Forensic Science
Krakow, Poland (September 16, 2000)

"The Firearms Evidence in the 1959 Clutter Murder Case-Holcomb, KS"
NIJ Conference on Science and the Law
San Diego, CA (Oct. 11-14, 2000)

"Drop-Fired or Fired and Dropped?"
AFTE Journal 32:2 (Spring 2000), pp. 154-157

"Rates of Fire for Some Common Semi-Automatic and Full Automatic Firearms"
AFTE Journal 32:3 (Summer 2000), pp. 252-258

"The Analysis and Comparison of Shotshell Buffers"
*Co-authored with Michael G. Haag
AFTE Journal 32:3 (Summer 2000), pp. 277-284

"Contemporary Russian 7.62x39mm Ammunition"
The CACNews First Quarter 2001, pp. 31-37

"Reference Ammunition for Gunshot Residue Testing"
CACNews Second Quarter 2000, pp. 24-29
AFTE Journal 32:4 (Fall 2000), pp. 332-336
SWAFS Journal 23:1 (February 2001), pp. 27-37

*"Preliminary Study to Evaluate the Deposition of GSR on Unfired Cartridges
in the Adjacent Chambers of a Revolver"*
AFTE Journal 32:4 (Fall 2000), pp. 346-351

**Lucien C. Haag
Presentations/Publications 12**

"A "Drop-Fired Cartridge"
AFTE Journal 32:4 (Fall 2000), pp. 352-353

Shooting Incident Investigation and Reconstruction
Los Angeles District Attorney's Office Seminar
Los Angeles, CA (January 27, 2001)

"Sunday, Bloody Sunday- It's Not Just the Name of a Song"
American Academy of Forensic Sciences
Seattle, WA (February 20, 2001)

"Übungspatronen"
American Academy of Forensic Sciences
Seattle, WA (Feb. 21, 2001)

*"Design, Exterior and Terminal Ballistic Performance
of 5.56x45mm SS109/M855 Bullets"*

"Base Deformation as an Index of Impact Velocity for Full Metal Jacketed Rifle Bullets"
AFTE Journal Vol. 33, No. 1 (Winter 2001)

"Contemporary Russian 7.62x39mm Ammunition"
AFTE Journal Vol. 33, No. 2 (Spring 2001) pp. 152-160

"Zee Bullets- Another Entry into the Lead-Free Market"
AFTE Journal Vol. 33, No. 2 (Spring 2001) pp. 149-152

"The Sound of Bullets"
"Once Fired, Twice Fired, Thrice Fired-More?"
Co-Instructor: Ricochet Workshop
AFTE Seminar (July 2001)

"Black Powder Substitutes: Their Physical and Chemical Properties and Performance"
The CACNews Third Quarter 2001, pp. 20-33

"Sources of Lead in Gunshot Residue"
AFTE Journal Vol. 33, No. 3 (Summer 2001), pp. 212-218

*"Two Unique .22 Caliber Rimfire Bullets from Aguila:
Performance and Properties of Forensic Interest"*
AFTE Journal Vol. 33, No. 3 (Summer 2001), pp. 276-279

"Übungspatronen: an Unusual Cartridge with some Unusual Properties of Forensic Interest"
**European Network of Forensic Science Institutes-FIA Working Group meeting
Brugge, Belgium (September 24, 2001)**

"Black Powder Substitutes: Their Physical and Chemical Properties and Performance"
AFTE Journal Vol. 33, No. 4 (Fall 2001), pp. 313-325

"Some Basic Analytical Techniques for Unfired Primer Compositions"
AFTE Journal Vol. 33, No. 4 (Fall 2001), pp. 326-331

**Lucien C. Haag
Presentations/Publications 13**

Shooting Incident Investigation and Reconstruction
Arizona Prosecuting Attorneys' Advisory Council Seminar
Tucson, AZ (August, 2001)
National College of District Attorneys Forensic Evidence Conference
San Diego, CA (December, 2001)

Shooting Scene Reconstruction Class
Arizona Homicide Investigator's Association
3-day class with live-fire demonstrations
Glendale, AZ (March, 2002)

"Once Fired, Twice Fired, Thrice Fired, More?"
A Novel Method for Assessing the Number of Firings of Shotshells with Plastic Bodies"
AFTE Journal Vol. 34, No. 1 (Winter 2002), pp. 11-15

"The Forensic Uses of the Oehler Model 43 Personal Ballistics Laboratory System"
AFTE Journal Vol. 34, No. 1 (Winter 2002), pp. 16-25

*"Balloting Bullets: Exterior and Wound Ballistics of Fired Bullets,
Physical Characteristics of Fired Bullets and Cartridge Cases"*
"The Calibration of Ballistic Chronographs"
*"The Effects of Cyanoacrylate Fuming on Trigger Pull Measurements
and Bullet Identification"*
AFTE Seminar (May 2002)

Ricochet Workshop
Instructor
AFTE Seminar (May 2002)

"RE: Comet Tailing"
AFTE Journal Vol. 34, No. 2 (Spring 2002), pp. 134-135

*"Average Pellet-to-Pellet Distance for Estimating Range of Fire
in Cases Involving Partial Pellet Patterns"*
AFTE Journal Vol. 34, No. 2 (Spring 2002), pp. 139-143

"The Exterior and Terminal Ballistics of 00 Buckshot"
AFTE Journal Vol. 34, No. 2 (Spring 2002), pp. 148-153

"The Sound of Bullets"
SWAFS Journal Vol. 24, No. 1 (May 2002) pp. 31-42
AFTE Journal Vol. 34, No. 3 (Summer 2002), pp. 255-263

"Skin Perforation and Skin Simulants"
AFTE Journal Vol. 34, No. 3 (Summer 2002), pp. 232-345
[Co-authored with Michael Haag]
"Custom-Made Molds for Ballistic Gelatin"
AFTE Journal Vol. 34, No. 3 (Summer 2002), pp. 321-322

"The Basics of Bullet Ricochet"
"The Bizarre and Mysterious Death of Sgt. 'C'"
ENFSI Firearms Working Group- Bratislava, Slovakia (Sept. 2002)

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Presentations/Publications 14

**5-day Shooting Reconstruction Course – *Gunsite Training Center* (Oct. 2002)
co-instructor with Michael Haag**

Instructor - *Ricochet Workshop*
"The Bizarre and Mysterious Death of Sgt. 'C'"
SWAFS Seminar - Scottsdale, AZ (Nov. 2002)
CAC/NWAFS Seminar - Reno, NV (April, 2003)
AFTE Seminar - Philadelphia, PA (May, 2003)
Maricopa County Medical Examiner's Office presentation (Aug. 2004)
Arizona Homicide Investigators Association Seminar (Oct. 2004)

*"Balloting Bullets: Exterior and Wound Ballistics of Fired Bullets,
Physical Characteristics of Fired Bullets and Cartridge Cases"*
AFTE Jour. 34:4 (Fall 2002) pp. 375-378

"Sound as Physical Evidence in a Shooting Incident"
SWAFS Jour. 25:1 (January 2003) pp. 36-41

The Exterior and Terminal Ballistics of OO Buckshot"
AFTE Jour. 35:1 (Winter 2003) pp. 25-34

"The SVD (Dragunov) Sniper Rifles: Features of Forensic Interest"
"Identifiable Bullets from Glock's in 60 Seconds"
AFTE Seminar - Philadelphia, PA (May, 2003)

"Multiple Collector ICPMS: A New Tool for Isotopic Analysis of Bullet Lead"
co-authored with Dr. Michael Ketterer, J.R. Vargas, M.T. Beddow and D.W. Smith
AFTE Seminar - Philadelphia, PA (May, 2003)

"Projectile-Induced Mechanical and Thermal Effects in Fibers"
*"Contemporary Less Lethal Munitions: Their Source, Design,
Exterior and Terminal Ballistic Properties"*
EAFS Seminar - Istanbul, Turkey (September, 2003)

"Light and Sound as Physical Evidence in Shooting Incidents"
AFTE Jour. 35:3 (Summer 2003) pp. 317-321

*Contemporary Firearms Evidence and Wound Ballistic Properties of Selected Projectiles
of Importance to Forensic Pathologists*
**Presentations at the Forensic Science Center/Medical Examiner's Office
Phoenix, AZ - March 10, 2004**

"Ballistic ID Tagging – A Further Look"
"Distance Determination Based on Pseudo-Stippling by Shotgun Plastic Buffer Material"
"MAKI Ballistic Medium"
AFTE Seminar - Vancouver, B.C. (May, 2004)

"Sequence of Shots through Tempered Glass"
AFTE Jour. 36:1 (Winter 2004) pp. 54-64

"The Case of the Talking Cartridge Case"
ENFSI Firearms Working Group Conference – Madrid, Spain (Oct. 2004)

**Lucien C. Haag
Presentations/Publications 15**

**Instructor
5-day Shooting Incident Reconstruction Course
Gunsite Training Academy – Paulden, AZ
November 8-12, 2004**

"Ballistic ID Tagging and Microstamping – Performance and Practice"
**National Academy of Sciences – Washington D.C.
December 9, 2004**

- "Extreme Pressure during Discharge or Something Else?"*
AFTE Jour. 36:3 (Summer 2004) pp. 230-236
- "Physical Forms of Small-Arms Propellants and Their Forensic Value"*
Am Jour For Med & Path 26:1 March 2005) pp. 5-10
- "Firearms Misadventures"*
1-day workshop by L. Haag, A. Jones & Fred Schmidt
"The Case of the Talking Cartridge Case"
AFTE Seminar - Indianapolis, IN (June, 2005)
- "The Source and Persistence of Lead in Gun Barrels"*
"The Dimethylglyoxime Test for Nickel Residues"
ENFSI Firearms Working Group Conference - Oslo, Norway (Sept, 2005)
- Lecture & Demonstration: *"Projectile Ricochet and Deflection"*
Shooting incident Reconstruction Course
Gunsite Training Academy, Paulden, AZ
October 2005
- Lecture: *"Firearms Identification and Shooting Reconstruction"*
Maricopa County Attorney's Office Seminar
December 16, 2005, Phoenix, AZ
- "Buried Secrets" (Tool Marks on Bone – the Alferd Packer Case)*
National Geographic / New Dominion Pictures –August 2005
- Lecture: *"Shooting to Kill-From the Expert's Eyes:
Firearms- What the Expert Can and Can't Tell You"*
National College of District Attorneys
National District Attorneys Association-
Seminar on Prosecuting Homicide Cases
May 7, 2006, Mesa, AZ
- "Bullet Holes in Wood and What We Can Tell from Them"*
"The Lincoln Target Board"
CAC/FSS of the UK Seminar - Concord, CA (May, 2006)
- "Some Thoughts, Observations and Suggestions
on the ENFSI FAID2005 Proficiency Test*
ENFSI FA/WG Meeting - Høje Taastrup, Denmark (June, 2006)
- "Bullet Holes in Wood- What Can We Tell from Them?"*
"The Lincoln Target Board"
AFTE Seminar - Springfield, MA (June, 2006)
- "Long Distance Shootings, Sniper Cases and Falling Bullets"*
1-day workshop by L. Haag
AFTE Seminar - Springfield, MA (June, 2006)
- "Anatomy of a Shooting: a Civilian's Death in Iraq"*

Lucien C. Haag
Presentations/Publications 16

National Public Radio (NPR) – All Things Considered 6/23/06

"Firearms Evidence and Shooting Scene Reconstruction"
APAAC Seminar - Tucson, AZ (July, 2006)

Letter to the Editor – "Identifiable Bullets from Glockes in 60 Seconds"
"The Effect of Revolver Cylinder Gap on GSR Production and Projectile Velocity"
[co-authored with Jon Tew]
AFTE Jour. 38:3 (Summer 2006)

"A Trail of Evidence"
NBC's Dateline – October 2006
(supplied ballistic data on 10mm pistol & ammunition)

"Firearms Evidence and Shooting Scene Reconstruction"
MCAO Fall Seminar - Phoenix, AZ (November, 2006)

"Licht und Knall als Beweismittel"
BKA/LKA Schusswaffensymposium - Dresden, Germany (November, 2006)
Der Auswerfer, 18. Ausgabe, Jan. 2007 pp. 85-101

"Trace Bullet Metal Testing for Copper and Lead at Suspected Projectile Impact Sites"
AFTE Jour. 38:4 (Fall 2006) pp. 301-301
[co-authored with Michael Haag]

"The Lincoln Target Board"
American Academy of Forensic Sciences – Last Word Society
San Antonio, TX (February, 2007)

"Firearms Evidence and Shooting Scene Reconstruction-Four Case Examples"
AHIA Spring Seminar - Glendale, AZ (March, 2007)

"Wound Production by Ricocheted and Destabilized Bullets"
Am. Jour. of For. Med. and Path. 28:1 (March 2007) pp. 4-12

Technical Contributor
Ruby Ridge: The Final Report
National Geographic Channel – March 13, 2007

"The Source and Persistence of Lead in Gun Barrels"
AFTE Jour. 39:1 (Winter 2007) pp. 8-23
[co-authored with Dr. Ludwig Niewöhner]

*"Bullet Length to Diameter Ratios and Caliber Determination of Bullets
in Surviving Gunshot Victims"*
AFTE Jour. 39:1 (Winter 2007) pp. 31-43
[co-authored with Melvin Lee Garrett]

Lucien C. Haag
Presentations/Publications 17

"Shotgun Range of Fire Determinations from Skin Stippling by Plastic Buffer Material"
AFTE Jour. 39:1 (Winter 2007) pp. 50-61

"Firearms Identification and Battlefield Archaeology"
Scottsdale Community College Lecture
Scottsdale, AZ (April 26, 2007)

"Muzzle Flash: Why Many See It and a Few Do Not"
"Words We Use and What They Tell Us About Our Thinking"
CAC Spring Seminar - Anaheim, CA (May, 2007)

"Listen to the Minié Balls: Identifying Firearms in Battlefield Archaeology", pp. 102-120,
Fields of Conflict: Battlefield Archaeology from the Roman Empire to the Korean War – Vol. 1, Praeger Security International, Westport, CN-London (2007)
[co-authored with Dr. Doug Scott]

"Words We Use and What They Tell Us About Our Thinking"
"Who Shot Sammy Weaver?"
"The Matching of Cast Bullets to the Moulds that Made Them"
Instructor: 2-day Workshop on-
Long Distance Shootings, Sniper Cases and Falling Bullets
AFTE 2007 Seminar - San Francisco, CA (May-June, 2007)

"Muzzle Flash: Why Many See It and a Few Do Not"
CACNews 3rd Quarter 2007 pp. 30-33
AFTE Jour. 39:2 (Spring 2007) pp. 116-126

"Muzzle Flash! Documenting the Demon"
The American Handgunner, Nov/Dec 2007

"Firearms Identification and Battlefield Archaeology"
Ft. Verde Days Lecture
Camp Verde, AZ (Oct. 13, 2007)

Co-Instructor with Michael Haag
5-Day Shooting Incident Reconstruction Course-Gunsite Training Facility
Paulden, AZ Oct. 29-Nov. 2, 2007, Sept. 29-Oct. 3, 2008

"The Matching of Cast Bullets to the Moulds that Made Them"
AFTE Jour. 39:4 (Fall 2007) pp. 313-322

"Talking Bullets"
"Falling Bullets"
Instructor: 1-day Workshop on-
Basic Trajectory Reconstruction
AFTE 2008 Seminar - Honolulu, HI (May, 2008)

"The Lincoln Target Board"
AFTE Jour. 40:1 (Winter 2008) pp. 47-56

*"The Exterior and Wound Ballistics Aspects
of Billy Dixon's Long Shot
and the Battle of Adobe Walls"*
AFTE Jour. 40:2 (Spring 2008) pp. 195-213

Lucien C. Haag

"Letter to the Editor-Microstamping Legislation"

AFTE Jour. 40:2 (Spring 2008) pp. 126-136

Book review (Human Factors Issues in Handgun Safety and Forensics)-

Journal of Forensic Sciences, 53:5, Sept. 2008, p. 1236

"Soft Damage – Hard Damage"

So. Cal Firearms Study Group - Santa Ana, CA (March 5, 2009)

"Cartridge Case Aging"

Arizona Firearms Study Group - Mesa, AZ (March 19, 2009)

"On the Matter of Chronograph Calibration"

AFTE Jour. 41:1 (Winter 2009) pp. 4-23

"Blackhorn 209 Propellant-A New Black Powder Substitute"

[Co-authored with Mahesh Patel – Phoenix PD Crime Laboratory]

AFTE Jour. 41:1 (Winter 2009) pp. 66-33

"Was That a Gunshot I Heard?"

CAC 2009 Spring Seminar - Lake Arrowhead, CA (May, 2009)

AFTE 2009 Seminar – Miami Beach, FL (June 2009)

"Is It a Bullet Hole?"

1-day Workshop

AFTE 2009 Seminar – Miami Beach, FL (May 31, 2009)

"Quo Vadis"

AFTE 2009 Seminar – Miami Beach, FL (June 2009)

"Flash Suppressors for AR-15 Type Firearms"

Co-authored with Aaron Brudenell – Tucson DPS Crime Laboratory,

Torrey Johnson – CA Criminalistics Institute, Sacramento, CA

Idan Greenberg – Firearms Advisor, Phoenix, AZ

AFTE Jour. 41:2 (Spring 2009) pp. 138-152

Small Arms Review Vol. 12 No. 12 (Sept. 2009) pp. 33-40

Co-Instructor with Michael Haag

5-Day Shooting Incident Reconstruction Course-Swiss Army Facility

Zürich, Switzerland June 22-26, 2009

"The Death of Huey Long, The Enigmatic Bullet and other New Evidence of Historic Interest"

AFTE Jour. 41:3 (Summer 2009) pp. 268-282

"Bore Lapping Compounds and Their Effect on Traditional Firearms Identification"

AFTE Jour. 41:3 (Summer 2009) pp. 232-245

Co-authored with Michael Haag, Lee Garrett, John Knell and Mahesh Patel

"Comet Tail / Vortex Effect"

AFTE Jour. 41:3 (Summer 2009) pp. 257-267

Co-authored with Evan Thompson

"Chemical and Instrumental Tests for Suspected Bullet Impact Marks", European Network of Forensic Science Institutes, 16th Annual Meeting of the Expert Working Group-Firearms/GSR, Wiesbaden, Germany, October 20-22, 2009
[co-authored with Mahesh Patel]

"Firearm Sound Level Measurements: An Impulse Sound Control Source of dB Measurements of Gunshots, Part 1"
AFTE Jour. 41:4 (Fall 2009) pp. 349-357

"The Tom Horn Affair: A Ballistic View"
American Academy of Forensic Sciences 2010 – Seattle, WA (Feb. 25, 2010)
Last Word Society

"Standard Steel BB Perforation of Pigskin over Standard Ordnance Gelatin"
AFTE Jour. 42:1 (Winter 2010) pp. 56-60

"Firearm Sound Level Measurements: A Study of Selected Parameters and Variables, Part 2"
AFTE Jour. 42:1 (Winter 2010) pp. 34-41

Author of the manual *"Forensic Pathology of Gunshot Wounds-Recognizing and Collecting Firearms Evidence"*,
2-day course, April 6-7, 2010, California DOJ/Criminalistics Institute
co-instructor with Dr. Frank Sheridan, Forensic Pathologist

"The Behavior of Expelled Glass Fragments during Projectile Penetration and Perforation"
"Chemical and Instrumental Tests for Suspected Bullet Impact Sites"
California Association of Criminalists – Yosemite, CA (April, 2010)
AFTE Seminar – Henderson, NV (May, 2010)

Terminal Ballistic Workshop
Instructor: 1-day class
May 7, 2010
AFTE 2010 – Henderson, NV

Class for AZ DPS Firearms Examiners:
Recognizing Reloaded Ammunition
May 26, 2010
FSSI-Carefree, AZ

"Chemical and Instrumental Tests for Suspected Bullet Impact Sites"
AFTE Jour. 42:2 (Spring 2010) pp. 132-144
CACNews, 3rd Quarter, 2010 pp. 11-25
Co-authored with Mahesh Patel

"Firearm Sound Level Measurements: Suppressed and Unsuppressed Firearms, Supersonic Bullets and Comparable High Amplitude Impulse Sounds, Part 3"
AFTE Jour. 42:3 (Summer 2010) pp. 209-228

*"The Exterior and Wound Ballistic Aspects of Billy Dixon's Long Shot
and the Battle of Adobe Walls"*
CACNews, 4th Quarter, 2010 pp. 31-41

Lucien C. Haag
Presentations/Publications 20

*"Firearms Identification, Shooting Scene Reconstruction and
Who Shot Sammy Weaver?"*
MindQuest presentation
October 12, 2010

"Bullets that Aren't"
*"Handheld Portable XRF Testing
of
Suspected Bullet Holes and Bullet Impact Sites"*
European Network of Forensic Science Institutes-F/A-GSR Group
Paphos, Cyprus
November 10-11, 2010

*"The Behavior of Expelled Glass Fragments
during Projectile Penetration and Perforation of Glass"*
AFTE Jour. 43:1 (Winter 2011) pp. 5-15
Am Jour For Med & Pathology, Vol. 33, No. 1(March 2012), pp. 47-52

"Drywall: Terminal Ballistic Properties of Forensic Interest"
AFTE Jour. 42:3 (Summer 2010) pp. 229-252
Co-authored with Alec Jason

Founder's Lecture
"Polythinking: Does It Have a Place and a Chance in the Modern Crime Laboratory?"
CAC Spring 2011 Seminar
Long Beach, CA May 17-20, 2011

"Talking Bullets-Talking Cartridge Cases"
Instructor – 1 Day Workshop – May 29, 2011
AFTE 2011 – Chicago, IL

"Bullets that Aren't Bullets"
"A Fatal SKS Incident"
June 1, 2011
AFTE 2011 – Chicago, IL

"Letter to the Editor-An Evaluation Study of Blood Elimination Solutions and Gunshot Residue"
*"Letter to the Editor-A Comparison of Several Substrates
Used for Gunpowder Stippling Evaluations"*
AFTE Jour. 43:2 (Spring 2011) p. 105

*Shooting Incident Reconstruction:
Case Examples and New Technology*
AZ Attorney General's Forensic Science Academy
October 7, 2011

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Presentations/Publications 21

"Bone Particles in Bullets: Their Recognition, Identification and Forensic Value"

"The Standard Bullet: Part 1 of 2"

European Network of Forensic Science Institutes-F/A-GSR Group

Lisbon, Portugal

October 25-28, 2011

Author of the manual *"Forensic Pathology of Gunshot Wounds-*

Recognizing and Collecting Firearms Evidence",

2-day course, November 15-16, 2011, **California DOJ/Criminalistics Institute**

Sacramento, CA

co-instructor with Dr. Frank Sheridan, Forensic Pathologist

"Some Exterior and Wound Ballistics of BB Guns, Pellet Guns and Airsoft Guns"

Southern California Firearms Study Group

Los Angeles, CA Dec. 8, 2011

"Hot Bullets vs. Cold Bullets: Are They Ballistically Stable - - "

Small Arms Review, Vol. 15, No. 4, (January 2012) pp.38-43

Co-authored by Idan Greenberg

Recognizing and Collecting Firearms Evidence

Sponsored by the Coconino County Medical Examiner's Office

Flagstaff, AZ

March 20, 2012

*"Contemporary and Historical Black Powder:
Physical and Chemical Properties of Forensic Interest"*

AFTE Jour. 44:2 (Spring 2012) pp. 92-105

Co-authored with Mahesh Patel

"Bone Particles in Bullets:

Their Recognition and Forensic Value"

AFTE Jour. 44:2 (Spring 2012) pp. 156-162

Co-authored with Mahesh Patel

Lecture and Demonstration of Inifinition® Doppler Radar System-

Chronograph Calibration

SoCal Firearms Study Group, April 26, 2012

San Bernardino, CA

Firearms Evidence for Death Investigators

Harris County Institute of Forensic Science

May 17, 2012

Houston, TX

Bullets through Bone: Hole Size as it Relates to Caliber
AZ Firearms Study Group Meeting
May 31, 2012

*"Bone Particles in Bullets:
Their Recognition and Forensic Value"*
"Where Are the Bullets?"
1-day Ricochet Workshop
AFTE 2012 Training Seminar
Buffalo, NY June 2012

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Presentations/Publications 22

"Where are the Bullets?"
Co-authored with Alexander Jason
AFTE Jour. 44:3 (Summer 2012) pp. 196-207
*"A Stable Reagent for Nitrite/Nitrate Detection and the Verification of Suspected
Gunpowder Particles"*
Co-authored with Michael Haag
AFTE Jour. 44:3 (Summer 2012) pp. 233-238

"A Fatal Misadventure with a Chinese Type 56 Carbine"
AFTE Jour. 44:4 (Fall 2012) pp. 63-70
"An Extreme Misadventure with an Inappropriate Propellant in an Otherwise Fine Rifle"
AFTE Jour. 44:4 (Fall 2012) pp. 71-79

*Shooting Incident Reconstruction:
Case Examples and New Technology*
AZ Attorney General's Forensic Science Academy
October 5, 2012

1-1/2 Day Shooting Incident Reconstruction Workshop
Co-instructor with Michael Haag
SWAFS Seminar-Scottsdale, AZ
October 22-23, 2012

1/2 Day Workshop- *"Is It a Bullet Hole-Impact Site?"*
SWAFS Seminar-Scottsdale, AZ
October 24, 2012

"The Ballistic Evidence in the Assassination of John Fitzgerald Kennedy"
Breakfast Seminar – American Academy of Forensic Sciences
Washington, D.C.
February 21, 2013

"The Forensic Aspects of Contemporary Disintegrating Rifle Bullets"
Am Jour For Med & Pathology, Vol. 34, No. 1 (April 2013), pp.50-55

"Range of Fire Determination from the Pseudo-stippling of Skin by Shotgun Buffer Material"
Am Jour For Med & Pathology, Vol. 34, No. 1 (April 2013), pp.56-62

"Revisitation of the 'Standard Bullet' and the Genesis of the Ballistic Coefficient",

AFTE Jour. 45:2 (Spring 2013) pp. 102-114

"Penetration Depth as a Statement of Impact Velocity: Forensic Implications and Importance",

AFTE Jour. 45:2 (Spring 2013) pp. 140-149

"Detecting and Identifying Bullet Holes by Tracer Bullets"

"The Assassination of John Fitzgerald Kennedy-

A 2hr. Special Presentation"

June, 2013

AFTE 2013 – Albuquerque, NM

Instructor – 1 Day *Wound Ballistics Workshop*

June, 2013

AFTE 2013 – Albuquerque, NM

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Presentations/Publications 23

*"The Recognition, Collection and Preservation of Critical Firearms Evidence
at Scenes and at Autopsy"*

Masters 15 Seminar for Pathologists and Death Investigators

St. Louis School of Medicine, St. Louis, MO

July 23, 2013

"The Assassination of John Fitzgerald Kennedy-

A Special Presentation"

August 15, 2013

Southern California Firearms Study Group, Santa Ana,, CA

September 18, 2013

Arizona Firearms Study Group, Phoenix, AZ

NEAFS Seminar, Cromwell, CT

September 26, 2013

National Association of Medical Examiners (N.A.M.E.)

Milwaukee, WI

October 13, 2013

"The Ballistic Coefficients of Ricocheted and Destabilized Bullets", AFTE Jour., 45:4 (Fall 2013),
pp.309-335

Radio Interview- *America Weekend* Nov. 9, 2013

Television Program: *Fox News Reporting: 50 Years of Questions-The JFK Assassination*

Aired Nov. 9, 2013

Television Program: *CBS: This Morning with Charlie Rose*

Aired Nov. 11, 2013

Television Program: *MSNBC: The Cycle*

Aired Nov. 21, 2013

Television Program: *PBS NOVA "JFK: Cold Case"*

Aired Nov. 13, 2013

Radio Program: *PBS: Science Friday with Ira Flatow*

Aired Nov. 22, 2013

"The Ballistic Evidence in the Assassination of John Fitzgerald Kennedy"

MINDQUEST – November 12, 2013

Phoenix, AZ

"A Firearms Examiner's Lament",
Acad. Forensic Pathol. (N.A.M.E. Jour) 2013 3(2): pp. 164-170

"The Use of Radio-Controlled Drones at the JFK Assassination Scene"
"Demonstration of Momentum Transfer in Wound Ballistics"
"Thoughts and Observations Regarding Wound Ballistic Media"
Arizona Firearms Study Group Meeting, Scottsdale, AZ – Jan. 29, 2014
SoCal Firearms Study Group Meeting, Los Angeles, CA – Feb. 6, 2014

"A Preliminary Look at Thermal Imaging of Firearms", **AFTE Jour.**, 46:1 (Winter 2013), pp.67-71

Lucien C. Haag
Presentations/Publications 24

Instructor
2-Day Firearms Evidence-Wound Ballistics Course
Santa Ana-Orange Co, California
March 3&4, 2014

Instructor
3-Day Lecture
CCI Firearms Academy
Research and Research Methods in Forensic Firearms
Sacramento, California
March 17-19, 2014

"Tracking the 'Magic' Bullet in the JFK Assassination", **AFTE Jour.**, 46:2 (Spring 2014),
pp.104-113

New England Div. of IAI Jour., Vol. 3, 2014, pp.6-19

"The Production and Persistence of Gunpowder Tattooing and Stippling of Living Human Skin",
AFTE Jour., 46:2 (Spring 2014), pp.125-132

*"Identifying Bullet Holes and Gunshot Wounds Produced by Tracer Bullets: Elemental Mapping of
Bullet Holes"*, **AFTE Jour.**, 46:2 (Spring 2014), pp.114-124

"Bullet Entry Holes in Fabric: Fibers, Facts and Fallacies", **AFTE Jour.**, 46:2 (Spring 2014),
pp.133-137

"The Gun that Really Won the West"
May, 2014
AFTE 2014 – Seattle, WA

Instructor- 3 Day Shooting Incident Reconstruction Class
Brigham City, UTAH
June 9-11, 2014

*"President Kennedy's Fatal Gunshot Wound and the Seemingly Anomalous Behavior
of the Fatal Bullet"*, **AFTE Jour.**, 46:3 (Summer 2014), pp.218-223

Co-author with Rick Wyant
Chapter 5

Less Lethal Impact Munitions: The Forensic Testing Model
**Risk Management of Less Lethal Options:
Evaluation, Deployment, Aftermath and Forensics**
By Wyant and Burns, CRC Press (2014)

PBS-NOVA "**COLD CASE: JFK**"
Presented at the ENFSI Conference,
Leeds, England
September 2014

"President Kennedy's Fatal Head Wound and His Rearward Head 'Snap'",
AFTE Jour., 46:4 (Fall 2014), pp.279-289

"The Gun that Really Won the West"
"PCP Airguns-Characteristics and Performance"
"The Soviet PSM Pistol"
December 3, 2014
SoCal Firearms Study Group – Fontana, CA

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Presentations/Publications 25

"Base Deformation of Full Metal-Jacketed Rifle Bullets as a Measure of Impact Velocity and Range of Fire", **Am. Jour. For. Med. and Path.**, 2015

"Wood Hardness via the Lowly Steel BB", **AFTE Jour.**, 47:1 (Winter 2015), pp.34-40
CACNews, 1st Quarter 2015 pp. 9-15

"The Gun that Really Won the West"
(Meriwether Lewis's Airgun)
Desert Foothills Library Lecture Series
February 19, 2015

"A Full-Auto Bryco: Measuring Cyclic Rate with *SoundForge*"
Projectile Momentum or Kinetic Energy: What if Anything Moves You?"
"Confronting and Exposing Unqualified 'Expert' Witnesses"
Arizona Firearms Study Group Meeting-Tucson, AZ
March 5, 2015

"The Ballistic Evidence in the Assassination of John Fitzgerald Kennedy"
The Forensic Science Academy
March 27, 2015
Phoenix, AZ
Desert Foothills Library Series
May 13, 2015

"The Missing Bullet in the JFK Assassination", **AFTE Jour.**, 47:2 (Spring 2015), pp.71-82
"The Russian PSM Pistol: A Unique Pistol and Unique Ammunition", **AFTE Jour.**, 47:2 (Spring 2015), pp.116-120

"Base Deformation of Full Metal-Jacketed Rifle Bullets as a Measure of Impact Velocity and Range of Fire", **Amer. Jour. of Foren. Med. and Pathology**, 36:1 (March 2015), pp.16-22

"The Sound of Gunshots and Measuring Cyclic Rate with *SoundForge*"

SoCal Firearms Study Group Meeting-San Bernardino, CA
April 23, 2015

"A Momentous and Moving Case"
CAC Spring 2015 Seminar
May 7, 2015
Ventura, CA.

"The Ballistic Evidence in the Assassination of John Fitzgerald Kennedy"
AFTE 2015 Seminar
May 26, 2015
Dallas, TX

Instructor-AFTE 2015 Workshop:
"Exterior and Terminal Ballistic Testing in the Assassination of John Fitzgerald Kennedy"
May 24, 2015
Dallas Police Department Range & Training Facility, Dallas, TX

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Presentations/Publications 26

"Firearms Evidence for Forensic Pathologists and Death Investigators"
[PowerPoint presentation and Syllabus]
International Association of Coroners and Medical Examiners Conference
Las Vegas, NV
July 30, 2015

3 Part Presentation – Arizona Homicide Investigator's Association
Flagstaff, AZ
July 31, 2015

Part 1: *"Shooting Incident Reconstruction-Avoiding Errors and Omissions"*
Part 2: *"The Ballistic Evidence in the Assassination of John Fitzgerald Kennedy"*
Part 3: *"Using the Kennedy Assassination as a Planning and Learning Exercise"*

"Death of the Shooter on the Grassy Knoll", **AFTE Jour.**, 47:3 (Summer 2015), pp.144-148

"The September 8, 1935 Assassination of Senator Huey Long, the Subsequent Shooting of Dr. Carl Austin Weiss and the Enigmatic Bullet"
Desert Foothills Library Series
September 29, 2015

"Gunshots, Bullet Sounds and Bullet Impacts"
SoCal Firearms Study Group Meeting-Santa Ana, CA
October 20, 2015

CBS-KPHO Phx. JFK Interview & Ballistics Demonstration
Nov. 22, 2015

"Bullet Impact, Kinetic Energy, Momentum, and What Will Move You", **CACNews**, 1st Quarter
2016, pp. 33-38

"Basic Forensic Firearms: Evidence-Chemical & Instrumental Aspects"

Lecture

Metropolitan State University of Denver
Chemistry Department – Instrumental Analysis Class
Jan. 28, 2016

"The Lindbergh Case Revisited – The Case that Never Dies"

Desert Foothills Library Series
February 13, 2016

"Misfired, Snap-Fired, Drop-Fired, Bang&Drop Firing Pin Impressions"

SoCal Firearms Study Group Meeting
Feb. 18, 2016
Az. Firearms Study Group Meeting
April 13, 2016

Author's Response to Aguilar/Wecht letter RE: Haag JFK articles, **AFTE Jour.**, 48:2 (Spring 2016, pp. 86-91

"Bullet Impact, Kinetic Energy, Momentum, and the Physics of What Will Move You", **AFTE Jour.**, 48:2 (Spring 2016, pp. 102-109

Lucien C. Haag
Presentations/Publications 27

"The September 8, 1935 Assassination of Senator Huey Long, the Subsequent Shooting of Dr. Carl Austin Weiss and the Enigmatic Bullet"

"Misfired, Snap-Fired, Drop-Fired, Bang&Drop, Drop&Bang Firing Pin Impressions"

"Federal TSJ Syntech Ammunition"

"The MagnetoSpeed Chronograph"

AFTE 2016 Seminar – May-June 2016, New Orleans, LA

Instructor- 5 Day Shooting Incident Reconstruction Class
for the
Forensic Science Society of the UK
Lincoln, England
June 20-24, 2016

"The Exterior and Terminal Ballistics of the Model 1780 Girardoni Air Rifle Carried by Meriwether Lewis During the Voyage of Discovery-1803-1806", **AFTE Jour.**, 48:3 (Summer 2016), pp. 131-137

"PCP Airguns: A Not so New Technology", **AFTE Jour.**, 48:3 (Summer 2016), pp. 155-162

"Gun Sounds, Gunshots, Bullet Sounds and Bullet Impacts: The Need for Consideration and Practical Research", **AFTE Jour.**, 48:3 (Summer 2016), pp. 138-154

"50 years of Reduced Loads"

"The Use of Downloads for Bullet Recovery and the Potential Effects of Striae Production"

"A Renewed Look at the Determination of Twist Rate in Certain Firearms"

"The LabRadar™ and MagnetoSpeed™ Chronographs

SoCal Firearms Study Group meeting September 28, 2016
Fontana, CA

Co-Instructor- 3 Day Shooting Incident Reconstruction Class
Bend, Oregon
Oct. 18-20, 2016

"The Use of Downloads for Bullet Recovery and the Potential Effects on Firearms Identification"
AZ Firearms Study Group meeting November 2, 2016, Scottsdale, AZ

Letters to the (AFTE) Editor RE: Gunshot Sounds and Max Holland's "The Lost Bullet"
AFTE Jour., 48:4 (Fall 2016), pp. 197-214

"Firearms Identification: Historical Development and Practice"
Arizona Supreme Court Judicial Conference,
Tempe, AZ
December 1, 2016

"The Use of 3D Laser Scanning in the Kennedy Assassination Scene-Dallas, TX"
Forensic Mapping Seminar
Phoenix, AZ
Dec. 16, 2016

"Firearms Identification and Evidence"
Maricopa County Attorney's Office Training Program
Phoenix, AZ
December 16, 2016

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Presentations/Publications 28

"Chlorindazon DS: a New Reagent for the Detection of Trace Amounts of Copper"
SoCal Firearms Study Group meeting February 9, 2017
Fontana, CA

Letters to the AFTE Editor RE: Holland & DeRonja "The Missing Bullet in the JFK Assassination"
AFTE Jour., 49:1 (Winter 2017), pp. 67-78
"Re-examination of the Value of Bunter Marks",
<Co-authored with Sergey Perunov and John Knell>
AFTE Jour., 49:1 (Winter 2017), pp. 23-35
"The Application of Doppler Radar to Bullet Ricochets from Water",
AFTE Jour., 49:1 (Winter 2017), pp. 36-42

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