

The CACNews

News of the California Association of Criminalists • First Quarter 2001



LISA BREWER

Distinguishing Characteristics

The Criminal Justice Department of California State University, Los Angeles, hosted the "Last Seminar of the 20th Century." Attendees had the opportunity to participate in interesting and unique workshops, such as the Entomology Workshop where individuals had the pleasure of handling live maggots and the opportunity to explore the fascinating world of decomposition on a dead pig. Our thanks goes to Hiram Evans (and his neighbors) who allowed the bovine to rot in his backyard and then he transported the carcass to the workshop site. Individuals who participated in the Forensic Anthropology Workshop learned, among other things, how to distinguish human and animal bones. They demonstrated their new found knowledge by picking out human bones mixed with a lot of animal bones. Who said there'd be a test?

The technical program began with the Founder's Lecture, presented by Jerry Chisum. Appropriately, Jerry reflected on the ghosts of criminalistics past, present and the future. Hopefully, the text of his lecture will be available in a future CACNews. The technical papers presented were varied and interesting to all. Our thanks goes to Tony Longhetti, Kathy Roberts, CSULA students and the multi-agency individuals who all worked to present the CAC membership with an excellent seminar.

As members of the CAC, we enjoy a number of benefits that help in our professional development. We are able to network and meet individuals from other forensic laboratories. Training opportunities are available through study groups, dinner meetings, workshops and seminars. The CAC has an endowment that funds training classes, research projects and scholarships. These are just a few examples of the benefits of CAC membership. The amazing thing is the CAC is a volunteer professional organization. All these benefits and programs I've listed are the result of the active participation of the CAC membership. This active participation can simply be attendance at CAC sponsored functions to service on committees and the Board of Directors.



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The Distinguished Member Award is presented to an individual in recognition of their active participation and service to the CAC. I had the pleasure to present this award to Greg Matheson (LAPD) on behalf of the CAC at the seminar banquet.

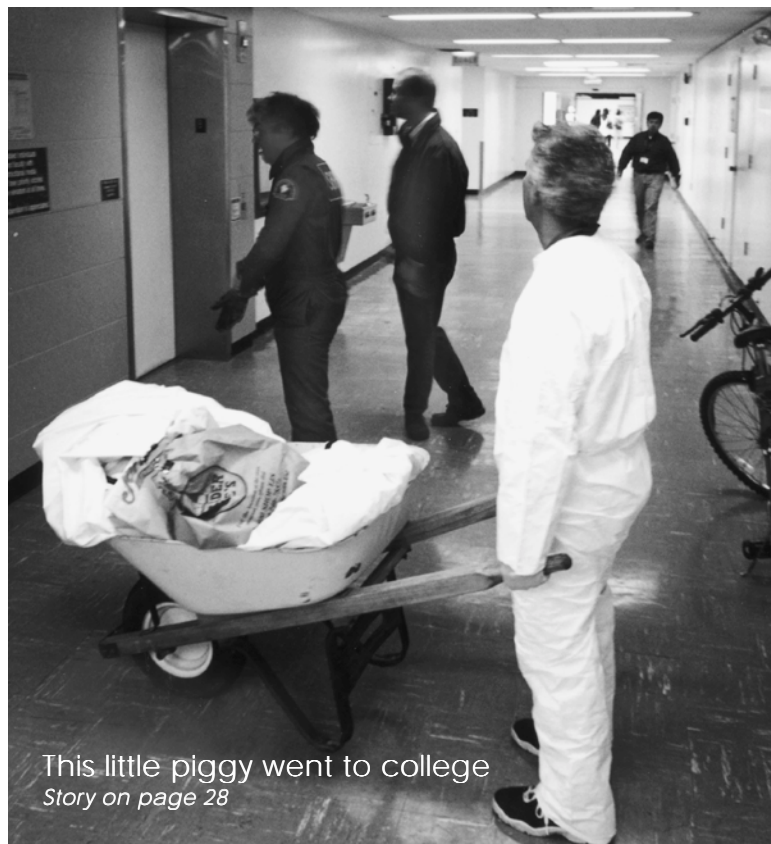
A member since 1979, Greg has attended forty semiannual seminars and numerous study group and dinner meetings. He has served on a number of committees including Seminar Chair, Awards, Certification Chair, Financial Review, Publications and recently agreed to serve on the Endowment Committee. He is a former board member, serving as President Elect, President, Immediate Past President and Regional Director-South. Additionally, Greg was one of the chief proponents of certification when the CAC developed and sponsored the first criminalistics certification program in the nation. He continued his commitment on behalf of the CAC, and the profession, by helping in the transition of the CAC certification program to the American Board of Criminalistics. He has, and continues, to represent the CAC on the ABC board. Greg represents our profession with a passion and is an inspiration to us all.

Another Distinguished Member Award recipient, Ed Rhodes, inspired the Edward F. Rhodes, III Memorial Award. Ed was a criminalist nationally recognized for his technical abilities, commitment to certification and his teaching ability. The purpose of this award is to give a CAC member, who is new to the field, an opportunity to attend a major forensic or scientific meeting of benefit to forensic practitioners. This year's recipient is Julie Leon, Ventura Co Sheriff's Crime Lab. Although she is a newcomer, she has already demonstrated her commitment to the CAC by her attendance at study groups and seminars, is serving on the Ethics Committee and was a Sponsor Coordinator for the latest seminar.

It's the contributions of the CAC membership, veterans like Greg and newcomers like Julie that makes the California Association of Criminalists an exceptional professional organization!

A handwritten signature in cursive script, reading "Lisa".

First Quarter 2001



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CACBits • Section News

CAC Members Attend BATF

National Firearms Examiner Academy

CAC members Michael Haag (Albuquerque Police Department), Nancy McCombs (DOJ-Fresno Lab), John Murdock (ATF-Walnut Creek) and Robert Thompson (ATF Walnut Creek) were asked to join a team of instructors for the Bureau of Alcohol, Tobacco and Firearms National Firearms Examiners Academy in Rockville Maryland. The academy, in its second year of operation, only accepts 10 students per academy from all over the country. This years students are Katharina Babcock (DPS-New Mexico), Aaron Brudenell (Idaho State Police), Jon Gardener (Ohio Bureau of Criminal Identification and Investigation), Travis Gover (Oregon State Police), Kendall Jaeger (Metro Police Nashville), Christopher Luckie (Alabama Department of Forensic Sciences), Mike Nickol (Maryland State Police), Leslie Poole (Sacramento County District Attorneys Lab), Mike Thomas (Baltimore County Police Department) and Jon Tew (Scottsdale Police Department). The academy began on August 1, 2000 and the students are expected to graduate on March 16, 2001.

Upcoming Meetings and Courses

Medicolegal Death Investigators Training, Jan. 22-26, 2001, St. Louis, MO

American Academy of Forensic Sciences, Feb. 19-24, 2001, Seattle, WA

Bloodstain Pattern Analysis Workshop, Mar. 5-9, 2001 Miami, FL

Human Skeletal Remains, Search, Recovery, and Identification Course, Mar. 12-17, 2001, New Orleans, LA

Digital Analysis of Bite Mark Evidence Two day Instructional Course, April 6-7, 2001, Santa Barbara, CA

Medicolegal Death Investigators Training Course, April 23-27, St. Louis, MO

Bloodstain Pattern Analysis Workshop, April 23-27, 2001 St. Paul, MN

Mid-Atlantic and Southern Associations of Forensic Scientists Joint Meeting, April 24-27, 2001, Williamsburg, VA

Spring Bloodstain Evidence Institute, April 30- May 4, 2001 Corning, NY

Forensic Applications Symposium: Scanning 2001, May 5-7, 2001, New York, NY

Advanced Bloodstain Pattern Analysis and Expert Witness Workshop, May 7-11, 2001, Miami, FL

California Association of Criminalists 97th Semi-Annual Seminar, May 11-12, 2001, Tahoe City, CA

California Association of Toxicologists Quarterly Meeting and Workshop, May 11-12, 2001, San Diego, CA

Association of Firearms and Toolmarks Examiners 32nd Annual Conference, July 8-13, 2001, Newport Beach, CA

CCI Courses:

Headlamp Examination, Jan 3-5, 2001

Hair Identification and Comparison, Jan. 8-12, 2001

Basic Forensic Serology, Jan. 16-19, 2001

EXX Advanced Ridgeology Comparisons, Jan. 29-Feb. 2, 2001

Statistics in DNA Analysis, Feb. 5-6, 2001

Latent Print Techniques, Feb. 26- Mar. 2, 2001

Paint Examination and Comparison, Mar. 5-9, 2001

DNA-PCR Short Tandem Repeat Analysis and Training, Mar. 13-16, 2001

Detection/Recovery: Footwear and Tire Impression Evidence, Mar. 21-23, 2001

Footwear Impression Evidence: Detection, Recovery and Examination:, Mar. 26-30, 2001

Tire Impression Evidence, April 2-6, 2001

Latent Print Comparisons, April 9-13, 2001

Microscopy of Explosives, May 14-18, 2001

Latent Print Techniques, June 11-15, 2001

Bloodstain Class

The Contra Costa County Criminalistics Laboratory in association with the FBI Evidence Response Team present the 40-hour course "Basic Bloodstain Pattern Analysis," to be taught by Tom Bevel, March 26-30, 2001 in Oakland. Class enrollment is limited to 24 students. Contact Eric Collins at (925) 335-1600.

Association of Firearm and Toolmark Examiners (AFTE)

32nd Annual Training Conference

July 8-13, 2001 Newport Beach, California

Contact: AFTE 2001, PO Box 12151, Santa Ana, California 92712

E-mail: Afte2001@fss.co.orange.ca.us Web site: www.afte.org

Jobs, Jobs, Jobs

Supervising Forensic Scientist Forensic Blood Alcohol

Ventura County Sheriffs Department \$4504-\$6320

800 S. Victoria Ave. Ventura, CA (805) 654-2308

Criminalist I

Santa Clara County Crime Laboratory \$3980-\$4815

(408) 299-2220 bdelre@crime.lab.co.santa-clara.ca.us

Criminalist

City of Mesa, Arizona \$47,299 \$63,835 annually, 20 E. Main Street, Suite 250 P.O. Box 1466, Mesa, AZ 85211-1466

Questioned Document Examiner

Oregon State Police \$2685-\$3877

400 Public Service Bldg., Salem, OR 97310-1380

www.oregonjobs.org

Jobs • Meetings • Courses

Criminalist

California State Department of Justice-Berkeley
Range A \$2674-\$3132, Range B \$3499-\$4320, Range C \$4215-\$5208, P.O. Box 944255, Sacramento, CA 94244-2550

Crime Laboratory Administrator

Iowa Division of Criminal Investigation, \$63,336 - \$78,790, (515) 281-5138 bogle@dps.state.ia.us

CA DOJ: The Department of Justice DNA Laboratory in Berkeley has several openings in the followings domains:

1. Method Development & Training, 2. Missing and Unidentified Persons DNA Data Bank, 3. Forensic Case Work, 4. Suspectless Case Work, 5. Convicted Felon DNA Databank, 6. Post Conviction DNA Testing Program, 7. Supervisory Positions. For more information please contact Margaret Algere at (510) 540-2434

IF YOU'RE LOOKING FOR EMPLOYMENT WORKING IN THE FAST GROWING FIELD OF DNA, the Department of Justice has a job for you. Visit our Website at <http://caag.state.ca.us> for education requirements.

The Bureau of Forensic Services(BFS) has immediate openings for Senior Criminalist/Criminalist/Laboratory Technicians to work in our DNA Laboratory in Berkeley and throughout the state. Incumbents will work with state-of-the-art laboratory equipment. Senior Criminalists are assigned to the more complex forensic casework. In addition, they may act as leadpersons to coordinate the work of lower-level criminalists. Senior Criminalists may also be assigned to provide training, application, methodology development, and research related to the field of criminalistics. The Criminalist is an entry, training, and subjourney level that works under general direction and performs routine and less complex technical laboratory analyses and assist senior criminalists in the examination of crime scenes and in the scientific investigation of crimes. Laboratory Technicians perform physical and chemical examinations of evidence, testify in court as to methods used and results obtained, assist criminalists and other laboratory personnel as needed, maintain inventories and equipment, and do other related work.

To apply for this examination, submit your name and address to the address listed below. Be sure to specify the exact title of the examination you are applying for. Names are accepted on a continuous basis and you will be sent a testing application the next time the exam is administered.

Department of Justice, Testing & Selection Office, P.O. Box 944255, Sacramento, CA 94244-2550, (916) 324-5039, Recruitment Hotline (916) 227-4883.

Assistant Criminalist

San Diego Police Department has an opening for an Assistant Criminalist/Criminalist position in the Alcohol and Narcotics Unit. Salary: (\$3779 to \$4580 Monthly) Criminalist (\$5046 to \$6098 Monthly.) Assistant Criminalists and Criminalists are also assigned to the on-call field investigation team. Detailed information about the position is located at www.ci.san-diego.ca.us. Select "search/employment opportunities/current city jobs/open/professional." For more information please contact Supv. Criminalist Patricia Lough at (619) 531-2460 or plough7537@yahoo.com.

OBITUARY

CHAO TZEE CHENG
1934 - 2000

Professor Chao Tzee Cheng died in his sleep on 21 February 2000 in the New York flat of his sister. He was on his way to the American Academy of Forensic Science conference in Reno having just attended a bioethics conference in Hawaii.

Professor Chao was a giant on the world forensic stage. He was born in 1934 and graduated MBBS from the University of Hong Kong in 1961.

There followed no fewer than 17 academic qualifications from the cream of the world's professional pathology and forensic medicine organisations.

Professor Chao's academic output was as substantial as the man himself. He was the author of 164 papers, chapters and books and was an energetic contributor on the international forensic lecture circuit. He was on the editorial boards of the world's four main forensic journals.

Anyone who knew Professor Chao will also remember his wit and humour, which extended on occasions to spontaneous renditions and performances at conference dinners and ceremonies. One story related by Dato' Mahade Shanker, founder President of the Medico-Legal Society of Malaysia goes as follows. Dato' Shankar had been troubled by some spiritual visitations in his chambers. The next morning he asked Professor Chao if he believed in ghosts. He instantly replied that ghosts ran away from him for fear of being subjected to another post mortem!

For his services in Singapore Professor Chao was awarded the Public Administration Silver Medal in 1975, the Gold Medal in 1979 and the Meritorious Medal in 1995. These, as did his other honours, sat lightly on his shoulders. In the best traditions of medicine, he was always ready to share his knowledge and never displayed the slightest hint of intellectual arrogance. These characteristics may be related to the fact that he was a devoted family man. To his wife Joyce Wong Yoke Choy, his son Dr. Alexandre Chao, daughter-in-law Dr. Koh Woon Puay and grand daughter Beatrice Chow we send our thoughts and sympathy.

*Stephen Cordner,
Congress Chairman*

*Congratulations Bill Smith
on his Retirement*

*Congratulations Caroline Garcia-Duncan
on the Birth of her new baby*

*Congratulations to Ann Murphy
on her marriage*

!!!

C.S.I.: Crime Scene Investigation

Another Episode in Missed Opportunity

REVIEW BY JOHN HOUDE

"We gotta follow the evidence even if we don't like where it takes us," says a forensic scientist on the new CBS show C.S.I. (Fridays at 9pm, CBS.) That's a good philosophy, but it somehow gets lost as the "super crims" of this TV drama rush around in helicopters, serve search warrants and interview victims and suspects. Maybe they meant testimony evidence and not the physical kind we were thinking of. Or perhaps what they do is what we should really be doing. After all, some crime labs let their criminalists work the "whole" case, but this is off the deep end. I haven't seen a criminalist shoot anyone yet, but can that be far behind?

I would be the last one to want the field of criminalistics to be hidden away in a lab. On the contrary, we should take every opportunity to show the world what we can do. The more jurors understand our abilities and limitations, the more appropriate weight they give to our opinions in court. Un-



Las Vegas P.D. criminalist (actor Gary Dourdan) examines a shoe for trace evidence on CBS' C.S.I.

fortunately, shows like C.S.I. pour out a stream of make-believe that serves only to entertain, rather than educate the viewer. I know TV shows are for entertainment, but consider that the premiere episode drew a staggering 17.3 million viewers, beating out such venerable standards as *NFL Monday Night Football* and *20/20*. These huge ratings indicate a real interest, even a public hunger for information about forensic science. The show hadn't time to develop word-of-mouth. These ratings were the result of trailers and the rather intriguing title of the show. That's a lot of people who could have been shown a realistic picture of what forensic science is like, and be entertained, too.

The show opens appropriately with *Who are you?* by The Who, while dramatic lighting and quirky camera angles along with a tense, pounding musical score heighten the drama. The mood is dark and there's a feeling of grim responsibility weighing heavily on our heroes—"We have so much power in this job," one sighs. But criminalists are made to look like wizards, reaching conclusion after conclusion with little actual analysis. If only it were so! Scien-

tific-sounding commands are barked out, "Reverse algorithm on that tape and then enhance it!" These are followed by quizzical looks on the faces of the ever loyal detectives who follow the energetic scientists around. Kind of the Mod Squad of forensic science.

C.S.I.'s executive producer is Jerry Bruckheimer, an old hand at making action films including *Beverly Hills Cop*

Perhaps what they do is what we should be doing?

and *Enemy of the State*. And, like any good mystery, there's a payoff scene at the end where the suspect/victim/witness is confronted by the scientist with proof of what really happened.

How I long for a show about forensic science that is realistic and true. There have been some great shows on cable, *Medical Detectives* being one, but as popular as those shows might be, they are like preaching to the choir. The millions of viewers that only casually watch a show like C.S.I. and then open up their jury summons are the ones I want to influence.

Viewers may recognize the lead scientist, played by William Petersen, memorable in his role as an FBI profiler in *Manhunter*, the prequel to *Silence of the Lambs*. You may want to rent *Manhunter*, as it portrays the crime lab more realistically than most of the dramatic movies I've seen.

I immediately began wondering, who is the technical advisor for this show? I'd heard rumors that the writers had tagged along with Las Vegas P.D. crime lab for some time, gathering stories and watching criminalists at work. But the credits don't list a scientific advisor. Instead, they mention Randy Walker, a recently retired LAPD SWAT member who has had a long career advising Hollywood on all things police. But the CNN website identifies Elizabeth Devine, a criminalist with Los Angeles Sheriff, as a "key adviser."

To be fair, there is an occasional good scene, including the one where our hero discovers a toenail in the shoe of a suspect who claims he injured his bare foot in an innocent way. We see a painstaking examination of a shoe, not very glamorous or dramatic, but to those who've spent their careers doing it, exhilarating when it pays off.

"You wanna call it?" This is the most fun part of the show where the criminalist, without benefit of much laboratory analysis, gets to play Sherlock Holmes and rattle off what they think happened during the commission of the crime. Cool. But it's done with such certainty! Almost like they were reading a script—oh, yeah . . .

I think our profession blew a golden chance during the O.J. trial to inform the public about what criminalistics is and can really do, and it looks like C.S.I. is yet another lost opportunity.

John Houde is the author of CRIME LAB: A Guide for Nonscientists, which received the Benjamin Franklin Award in science.

ENGLISH LESSON

ESSAY BY DIANE BURNS

Only a handful of American criminalists have had the opportunity to study forensic science alongside their counterparts in the United Kingdom. I have the good fortune of being able to do just that while completing a one year MSc in Forensic Science degree at King's College of London.



King's College was established in 1829 and is situated in downtown London along the southern bank of the River Thames. The venerable river snakes its way through the heart of the city. Walking to classes each day, I cross over the Thames by way of the Waterloo Bridge. On my right is Big Ben. To my left rises the majestic dome of the Old Bailey - the most famous courthouse in the world, hosting eight centuries of crime and ever looking the part.

There is no questioning the British contribution to the history of crime detection. Englishmen Sir Francis Galton in his book *Fingerprints* (1892) and Sir Edward Henry who wrote *Classification and Uses of Fingerprints* (1896) developed a system of identification still in use throughout much of the world today. Then there is Alec Jeffreys, whose involvement in the 1986 Colin Pitchfork murder investigation was made famous by Joseph Wambaugh's book, *The Blooding*. It greatly changed the way we perform forensic investigations altogether. One of my instructors at King's, a gangly stick of a man, said of Jeffreys, "Alec Jeffreys proves there is hope for everybody. When we were taking undergraduate courses together he was just an ordinary chap who is now world famous."

The British forensic thumbprint is embossed inside volumes of criminal history. For example, the Sherlock Holmes legacy lives on in perpetuity. Scotland Yard is home to perhaps the most famous police department in the world. The legendary Great Train Robbery took place on a night train from Glasgow to London in the summer of 1963. Of course there are the "Rippers", as in Jack and The Yorkshire. More recently, England experienced Harold Shipman who murdered an almost incomprehensible one hundred thirty-two elderly women by injecting them with lethal doses of morphine. Shipman was tried at The Old Bailey in 1998 and sentenced to life, putting an end



Before coming here,

I had only a vague

notion of what the

British were like as a

people, most of it

perpetuated by

media stereotypes.

Were British men

anything like the

eerily editorialising

Hitchcock on his

half-hour television

program or were

they more like the

suave James Bond?

to what proved to be a sensational case involving human exhumations and forensic computer sleuthing. This rich criminal backdrop made me eager to come to London to study forensic science.

In deciding to come to King's, I considered attending the other graduate forensic program the UK has to offer—Strathclyde University located in Glasgow, Scotland. Graduates of Strathclyde claim their university has the better program, which may or may not be true. However, Glasgow is not London. Samuel Johnson said, "When a man is tired of London, he is tired of life; for there is in London all life can afford." After living here for the past three months, I have to agree. London is history, tradition and excitement.

I knew I wanted to be part of a forensic program that was the real thing. I wanted my instructors to be practicing forensic scientists, not professional academics one chapter ahead of me in *Saferstein*. I wanted rigorous physical science courses, not a program that was capitalizing on the popularity of the field by inserting the word *forensics* in front of a pseudo-science class in order to fill seats. Lastly, I wanted hands-on experience outside my classroom activities—an opportunity to research a thesis topic and present it in a scientific format suitable for publication. King's offers this opportunity by providing a four-month work placement with the London Metropolitan Police or The Forensic Science Service. Back home, a forensic education at this level is rare or sadly non-existent altogether. I continue to be puzzled why this is.

In my studies, I am focusing on forensic analytical chemistry. It is my own personal belief that analytical chemistry remains the cornerstone of forensic science, despite white-hot advances in molecular biology and the

DNA juggernaut. The course work is broken up into modules—mini courses, most with labs. For example, I recently completed a six-week module in Forensic Statistics and Data Interpretation.

I am now onto Forensic Analysis and Spectroscopy along with Analytical Chemistry and Chromatography. Both of these modules cover theory in detail

during lecture and have labs with practicals. Our unknown samples are actual controlled substances. Biologists will



please turn to page 20

NANCY MCCOMBS

Much More Than This

CAC Seminars are frequently referred to as places to "exchange information", "share ideas" or "make contributions." Yet why do we limit our translation to strictly technical information, ideas and contributions? The CAC is much more than this.

It is not uncommon to visit with friends and colleagues at seminars only to discover they, or their laboratory, is experiencing a time of low morale. Just as no person is perfect, neither is any laboratory. Regardless of how understanding our outside friends and families may be, with parallel professions come parallel experiences. For who better comprehends our occupational encounters than our own peers? CAC, in addition to functioning as a means for exchanging technical information, may also serve as a valuable support media for its members. In a sense, attendance at meetings can prove to be mentally uplifting!



Who better comprehends our occupational encounters than our own peers?

In addition to the hours dedicated to professional papers, CAC Seminars are usually packed with breaks, breakfasts, lunches, dinners and evening social events. It is during these times that we habitually greet fellow members with, "How are things back at the laboratory?" If we are not prepared for an extended response, perhaps we just shouldn't ask.

"Escaping" to CAC Seminars is often a pleasant respite from the laboratory. Yet, the benefit we gain from recommendations by members who have faced similar situations and the gratification we feel when approached by those seeking our advisement is equally as rewarding. Suppose we adopt the viewpoint, "I'm honored my colleague feels comfortable enough to entrust me with this issue" instead of, "Oh no, not another dilemma", then a new dimension could be added to the exchanging of information, ideas and contributions.

Nancy

F E E D B A C K

The CACNews prints letters to the editor that are of interest to its readers. We reserve the right to edit letters for brevity and clarity. All submissions to this page become the property of the CACNews.

New Horizons for Nancy

[I heard] that you do not intend to seek reelection as editorial secretary for *The CAC News*. I'm sorry to hear that. I'm sure the job has taken up a lot of your time and left less for interaction with your family. But each issue during your tenure has been outstanding, and you will be very hard to replace. The CAC needs more people like you, and I hope you will consider serving in other official positions in the future.

Bob Blackledge

It only seems like yesterday that I was writing a fond farewell for Raymond Davis. Has it been two years already? My, how time flies when you're having fun!

Nancy, I will miss your steady hand on the tiller of this newsletter. During your tenure, we've had the pleasure of be a

part of some excellent achievements such as the creation of the *cacnews.org* website and the special Criminalistics 2000 issue. Thank you for all of your help and guidance in editing and especially in being the "enforcer" of deadlines! Best wishes.

John Houde

Paul Kirk Remembered

Paul L. Kirk left this world thirty years ago. Since that time, a whole new generation of people have become the Crime Laboratory population of California, many of whom had not been born until after 1970. I suspect that most of our membership know very little about Paul, that he literally created the foundations, including the ontology, of what we now know as CRIMINALISTICS.

Editor's Note: In the previous issue, two illustrations were omitted from Bob Blackledge's article, "Glue Traces on Cotton Swabs in Sexual Assault Kits" because of a text-conversion software glitch. The figures are reproduced below.

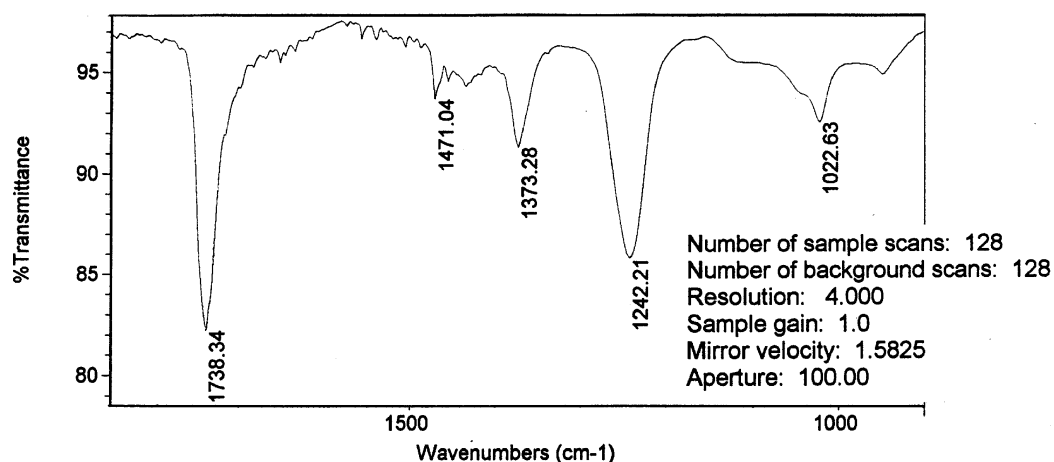


Figure 1. Chloroform extract of 1/2 of vaginal swab from victim, evaporated onto 3M IR Card. Background = blank card.

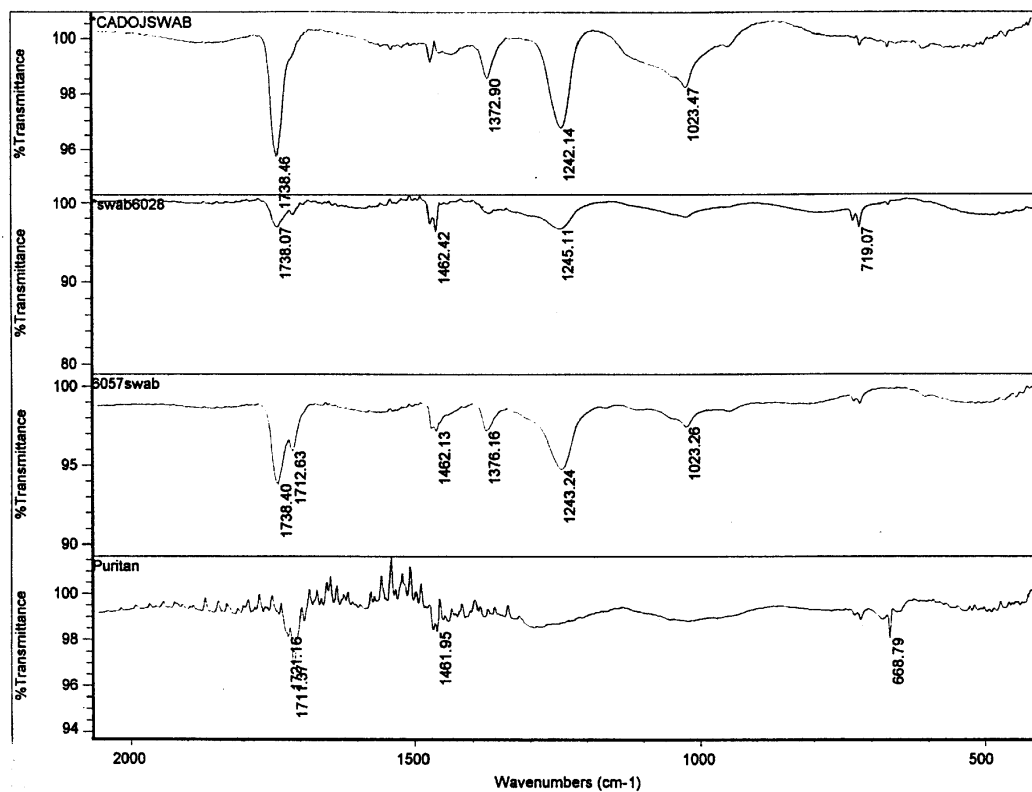


Figure 2. FT-IR spectra of chloroform extracts from 1/2 of blank swabs (same conditions as Fig. 1). Top to bottom: Pur-Wraps® swabs lot nos. 5530 (CADOJSWAB), 6028, 6057, and Puritan® swab lot no. 1121614D.

Feedback, cont'd

Following is a memorial that I presented at his funeral services, which was later published in the *Journal of Criminal Law, Criminology and Police Science*. Republishing this in the CACNews would be an appropriate memorial to the memory of Paul L. Kirk on the thirtieth year since his passing.

Lowell Bradford

Paul L. Kirk 1902-1970

There are many measures of success in life. Of these are the footprints on the sands of time, such as a painting, a poem, a novel, community service, service to profession and service to Country; i.e. a contribution to those who follow on. An even greater type of measure is the length and number of pioneer trails or bridges of scientific achievement, which lead others into breakthroughs and over obstacles so that mankind can progress; i.e. those who follow have the pathway and direction established and can make rapid progress.

Paul L. Kirk has given us both types of heritage. There are three characteristics which should be distinctively emphasized. The first is his gift of research. He was a prolific producer of research and development results. There are approximately two hundred fifty scientific and professional articles to his credit which expound his contributions, as well as five published books and two more in progress. He was one of the most ingenious microchemists of his day. He developed a whole system of microchemistry called "ultra-micro" or "drop-scale" analysis. This methodology has been applied all over the world in medicine, research and industry. The methodology involves simplicity and ingenuity, and played a key role in the development of the chemistry of plutonium and other compounds in nuclear chemistry.

A second major gift was the bringing forth of criminalistics as an approved academic, major in the USA. During the difficult years of 1947-1950, he helped to preserve the entire criminology program at the University of California when it needed help to avoid being disregarded and dropped. He transitioned subsequently from professor of biochemistry to professor of criminalistics which in itself is a unique event. This happened because he had developed many methods to deal with small samples, and they were of interest to examinations needed in law enforcement and medicolegal problems.

Many agencies in the criminal justice system placed demands upon his talents for methods of evidence problem solution. During this era he developed new systems for the examination of all kinds of evidence materials such as blood, soil, glass and hair. His development of methods for application in forensic science are unprecedented and unparalleled.

The third characteristic is that of Paul Kirk, the humanist. To his students he was the first professor that most had encountered who had the time—nay, took the time to sit down and talk at length with his students. He became interested in their futures and problems; he coached them; he helped them; he advised them; but most importantly, he stimulated them to achieve new heights. By example, he demonstrated that the candid position is not always a popular one, that leadership can be a lonesome job and that controversial issues can be debated in a gentlemanly manner.

All of the people who use and benefit from his methods today, and especially his former students, stand in a great debt to him for his altruism to research and development and for the contributions that he has so personally made to science and especially to the forensic sciences. Those who have had the good fortune to know him and work with him have had an experience that is incomparable and knows no end.

Wanted: Stories of Luck

Criminalists and investigators: I am interested in narrative descriptions of cases in which you felt that some lucky circumstance or event was critical or significant in leading to a successful investigative conclusion. My intention is not to diminish the role of the investigator. I simply wish to show that luck can be a factor. Photos or graphics would also be much appreciated. If published, full credit can be given, or full anonymity to the investigator and the agency can be assured. For more information, contact Morris Grodsky, 912 638-7768, or mgrodsky@thebest.net, or Morris Grodsky, 1219 Beachview Drive, St. Simons Island, Georgia 31522

Getting to Know You

I was delighted to read Luke Haag's article and personal story in the Second quarter issue of the CACNEWS. I've known Luke for over 25 years. And

like most of us, know him only as the man who delivers those powerful, informative technical presentations at seminars & workshops. Further, that he is able to do so with such ease and grace that he kept us in rapt attention. It was a pleasure therefore, to get to know more about Luke the person. Thanks Luke. p.s. Who wants to be next?

Raymond Davis

C.S.I. Show Defended

I have been a criminalist for LASD for fifteen years and a CAC member for approximately that long. . . and I am also the technical advisor for C.S.I. (See *Review*, this issue.) Another CAC member Harry Klann of LAPD worked on the pilot and soon learned as I have quite early, that "technical advisor" means informing the writers/producers/actors of what really happens and what is really done...and they either use it or not depending on what the story needs. Harry and I both worked on the first six episodes until Harry had a scheduling conflict, when I took over. We were involved in script assistance and providing the TA resource on the set. Randy Walker's company "Call the Cops" hired Harry and I to work on the show. His company has had an excellent relationship with Hollywood for 12-plus years. There was always an experienced criminalist giving input on the technical aspect of the show, not "swat cops" as you so inaccurately implied.

Some of your research was accurate; the creator of the show did follow crime scene investigators around in Las Vegas for weeks prior to writing the pilot. Much of what the creator wrote was based on information he was given, or observed while he was on his fact-finding mission. The gun-toting, interview-ready crims were his understanding of crime scene investigations conducted for Las Vegas P.D. When I first told the writer's that we don't conduct interviews or carry guns he replied "they do in Vegas." The sources in Las Vegas also told him they were the nation's second best crime lab (I didn't know there were rankings). He was told that they interview suspects as I have already mentioned although I am sure the context was with property crimes and not murders. But, the seed was planted. There were many other mysterious impressions the

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The CAC Founder's Speech (delivered October, 2000)

Jerry Chisum

Good Morning.

Before I start, I wish to throttle — er, I mean, thank John DeHaan for the task, I mean, honor he stuck me with, I mean bestowed upon me by twisting my—, I mean, asking me to give the Founder's speech. I think I have the wrong set of notes.

Really, I am very honored to have been asked by John to be one of the persons who have given CAC Founders Speeches. Those persons are some of the most respected in the field and I am proud to be asked to join their ranks.

When I speak to a class, I know what I am going to talk about. The subject matter of the class, but I was not given a defined subject for this presentation. I didn't know what to speak about. Since Tony Longhetti is the host, and he gave the last Founder's Speech, I asked him what he thought the Founder's Speech should cover. He was no help. He said it was up to me, but, he added, the theme of the meeting is The Past, Present, and Future of Criminalistics. That sounds like a good theme, so I will try to adhere to it.

Having worked for Tony for my first four years in this field, I should have expected that response. He wouldn't answer questions then either. He made me research my own answers. For example, he would mark red circles on my reports, for every slight grammatical error or misspelled word. If I made a mistake in logic or he questioned how I did something, he would write the dreaded words "See me!" He wouldn't tell me what was wrong until I had researched the problem myself. Then I had to submit the corrected version to him to mark up again. This wasn't a correction on a word processor; we dictated our reports, including the punctuation. The secretary had to type them on a manual typewriter. She would be upset if I couldn't get it right on the second try. And you didn't want to ever upset the secretary.

He had an "open door" policy, but if I went to him with a laboratory or case-work problem he was the same way. He referred me to the rather extensive card file we had taken from the approximately 60 journals we subscribed to. Part of our job was to abstract articles from those journals. I doubt that he has changed in regard to finding solutions, as I imagine the students from Cal State have found out. I thank Tony for making me learn to seek out answers and to try the things I found in the journals. If he is the same at the University, you students should also be thankful, as you will know how to think.

The problem is not always the answer, it's the question. As in the Hitchhiker's Guide to the Galaxy¹, the Ultimate Answer is available, but you must ask the right question for it to make sense. This field is much like that. We decide what questions to ask of the physical evidence, then determine how to answer those questions. That, to me, is what criminalistics is about. When I started in this field we found out everything we could about a case before we started the analyses. This might include responding to a crime scene. I went to a number of burglary scenes as well as homicide scenes. At each of those scenes, the team sought the answers. By the team, I mean the investigator, the identification technician, and the criminalist. Each had their own jobs to do but each contributed the information garnered to the common knowledge pool.

Now everyone wants to be recognized as the expert in a specific field. I found it easy to become such an expert, but you don't always want it to be known. One of my first cases illustrates that point. In those days we worked on all types of crimes. But, this case established me as the leading expert in a particular field and I haven't heard that anyone has attained or even challenged my expertise in the past 40 years.

One Monday, a detective came in with a test tube labeled: "Hairs removed from penis of Joe Smith." He said that "Joe" was caught at a local stable and was suspected of having committed bestiality on one of the horses. Actually those aren't the words he used, I'll leave those to your imagination. I examined the contents of the vial and identified three horse hairs. I gave the detective the vial back and wrote a report.

The following Monday, the same detective laid a vial on the counter labeled, "Hairs removed from penis of Joe Smith." I said, "Wait a minute! I've already examined this and identified horse hairs." He replied, "No, you haven't, these were collected yesterday, from the same man at a different stable."

The man had made bail and returned to a stable next to the one he had visited before. Unfortunately for him, he tried to run past the owner, "an old man on canes." But the "old man" was not so slow and the canes had built his arm strength. He hit Joe in the jaw, breaking it in three places.

Founder's Lecture presenter Jerry Chisum (center) is congratulated by John DeHaan (left) and Tony Longhetti. The lecture was given at the Glendale Hilton.



Not satisfied with the information that the hairs in the two cases were from horses, the prosecutor wanted to know if I could identify the particular horses that the hairs came from. When I told them to go find the cutest one, they didn't laugh. So, I went out to the stables, I removed hairs from the rears of several horses, including two geldings and one mule. I examined the hairs in the lab and made comparisons. I spent hours studying the colors, diameters, lengths, scales, etc. But, I couldn't tell from which animal the hairs had originated. At the next CAC dinner meeting, Tony told everyone about the case, in great detail. I immediately became known as the "state's leading expert on horse's asses!"

I must say that since that time I have seen a lot of them—and most are not associated with horses!

The point is not that I'm still the leading expert on the subject, but that this field is not always serious. You must take some time to have fun, even at your own expense. In fact, if you love this field as I do, being involved in an investigation of a criminal matter, trivial or serious, should be a personally enjoyable experience. That extends to the witness stand as well. If not, then either you were unprepared to take on the case or the witness stand or you should find another field of endeavor. I had four sons, as they were growing up they would ask me what they should do when they grew up. My answer was simple. Get the education to do what you really enjoy doing. Not a one of them is in any way working in law enforcement or related field. You in this room, have the education to do a job, hopefully it is the job you enjoy doing. But, and I'm sure the "old timers" here will agree, schooling is not enough, you need to add to that education by developing your expertise.

You develop your expertise through your experiences, not only case work, but life experiences as well. Something I read recently reminded me of the philosophy that should permeate your professional life; I can only urge you to think for yourself, and remind you that this is impossible unless you have something to think about, a fund of factual information² You must use every experience as a source of knowledge. Hans Gross, the Father of Criminalistics, stated that we need to observe everything and determine the reasons for what happened as a consequence.³ He felt that all of our life experiences give us an opportunity to gain knowledge about cause and ef-

fect. A criminalist must observe the effects and extrapolate the causes. The problem is that we are dealing with what people do. An incident of human behavior becomes a challenging puzzle⁴. One of my favorite quotes on this subject is by Douglas Scott and Melissa Conner in the book, *Forensic Taxonomy*.

"Reconstructing human behavior from physical evidence is a multidimensional jigsaw puzzle. Pieces of the puzzle are missing, damaged, and some are even camouflaged. The puzzle pieces come in seemingly incompatible data types—some are visual, some are in such microscopic form that it takes days of specialized analysis to show their existence, and in some cases the evidence is intangible, such as oral testimony. But practitioners of these two disciplines, each for totally different reasons, sit at their desks and doggedly persist in completing these puzzles—archeologists and forensic investigators."

That philosophy should be the guide for being a criminalist. Long before it was published I followed it. I learned it from several people, Tony Longhetti and the persons I associated with that were the Founders of this Association.

**If you love this field
as I do, being involved
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enjoyable experience.**

Founders

Who were these people that were the founders of this association? Why did they form the CAC? I think I have an answer to that question that I will cover later.

Did the founders plan to have such a prestigious organization? Were they so prophetic that they expected the CAC to be the leading forensic organization in the world? No, they were just people, like you.

You must realize that the world was different when this organization was formed. The computer was called VARIAC or EINIAC and there were only a couple of them in the world at research organizations. The personal computer

didn't exist, and the Internet was far in the future. Long distance telephone calls were expensive and you had to, in most areas, go through the operator, in a few places you were able to put your finger in a hole, rotate this disk on the front of the phone and dial the numbers, pushing keys was not an option. The airlines flew propeller driven airplanes. The freeways you drive on weren't even in the planning stage, I-5 didn't exist, U.S. 99 went through the main part of every town in the central valley. Fresno and Bakersfield had roundabouts, the "new" traffic control method recently installed in Sacramento. Travel was slower and more complicated than it is today. These men simply wanted to get together to exchange some ideas. They gave no thought to what this organization they had created would become.

I came in to the field some 12-13 years after this Association was started. Those men, with one exception, were still here. It doesn't seem that long ago that I would meet with these people at the CAC seminars, dinner meetings, and in their laboratories. Some I knew better than others. A few of you, like me, knew them all. Many of you knew one or two. Most of you have heard of several of them, but there are probably a number that you haven't. To you they are just names or, in some cases, icons. But they were real people. I recently found a quote by Marcus Aurelius that I think applies to my view of the world of the CAC.

"How soon it is that so many that were in this world when I came into it are now gone from it."

I may not have it exactly correct, in fact, not even near, as Marcus spoke in Latin, but I do have the meaning and sentiment correct. Marcus was missing those friends and associates who had been his mentors. Likewise, I miss these men.

There are not any of the founders still working in this world of criminalistics, they have retired, only a few ever make it to the Seminars. It saddens me to think of so many friends who have passed out of my life. Who were the founders? Their names and agencies when they started are:

Jim Brackett, Santa Clara DA; Lowell Bradford, Santa Clara DA (actually started in Sacramento CII); Ron Briglia, Orange County SO; David Q. Burd, CII (DOJ); Jack Cadman, Orange County SO; Bob Cooper, Oakland PD; John E. Davis, Oakland PD; Roger Greene, CII; Don Harding, Pasadena PD; Bill Harper (I'm not sure where he started,

he was expelled from CAC before I became a member. However, I met him on a case in Bakersfield and we had dinner together.); Harry Johnson, CII (The most overlooked Founder.); Lee Jones, LAPD; Paul L. Kirk, UC Berkeley; George Lacy, LASD; Ray Pinker, LAPD; Hilliard Reeves, Richmond PD.

I first met many of these men at a CAC Seminar dinner at the Hotel Claremont in Berkeley; it must have been in 1959. I was a student in Professor Kirk's class, even though I was a Chemistry major and couldn't attend the day time activities of the Association. Professor Kirk thought it would be a good idea to at least attend the banquet. I remembered that meeting this August when I went to Canyonlands National Park in Utah. The speaker, at the meeting, was Hillard Reeve, he showed slides and talked about his experiences hiking in the beautiful red canyons in Utah. He was most probably in some of the canyons now covered by Lake Powell. His presentation was personal, in those days we didn't have special invited speakers.

At that meeting, I had a fellow student on my left and an "old man" on my right, he must have been 55. He kept up a constant conversation, even while eating. I felt somewhat embarrassed by his table manners. At the next seminar¹ I attended, now as a member of the hosting agency, San Bernardino, I sat next to the same old man at the dinner. I knew he would be at the next local meeting so I asked Tony if he would make sure that I didn't have to sit next to him again. As soon as we arrived, Tony called out to Ray

Pinker and told him I was tired of sitting next to him at the dinner meetings. Of course, Ray sat next to me again.

Little did I realize, at that time, how privileged I had been, to be next to the first public criminalist. I soon had a lot of respect and love for that man. I would like to tell you a little known fact about Ray. He was the oldest man in the CAC. He attained the age of about 250. Each month, at the dinner meeting, we would celebrate his birthday, the restaurants would bring him a dessert with a candle and everyone would sing Happy Birthday. At Seminars, he would have two or three birthdays.

I could tell you something about each of the Founders as I was fortunate enough to know and "break bread" with each of them. However, that would detract from the direction I want to go. Suffice it to say, the CAC owes its existence to these men. I would like to see a plaque with their names displayed at every Seminar. That way, when people like Tony and I are also gone from this world, the CAC membership will not forget who started this Association.

You may wonder what kind of criminalistics did these men practice? With one exception², I can only tell you what we did when I joined. That exception was the oldest case I found in the CII files. A blood stained piece of glass was submitted to the laboratory. Some people had heard a shot, then a car drive off at a high rate of speed. There was a blood pool near the tire tracks.

I thought how quickly we could have resolved the case and told them

whether the blood was human or not. We would run the precipitin test. However, when Roger Greene worked this case, there was no precipitin test. He examined the blood under the microscope. He stated that the blood contained a couple of hair follicles, too small for identification, but didn't look human, he couldn't be sure but they were probably from a domestic animal. The size of the blood cells was also slightly smaller than human cells. He then stated that he had cultivated the stain. The bacteria were identified as that associated with mange in dogs. Therefore, he concluded, the blood was from a mangy dog.

I realized, at that point, that we could do things a lot faster, but not necessarily better.

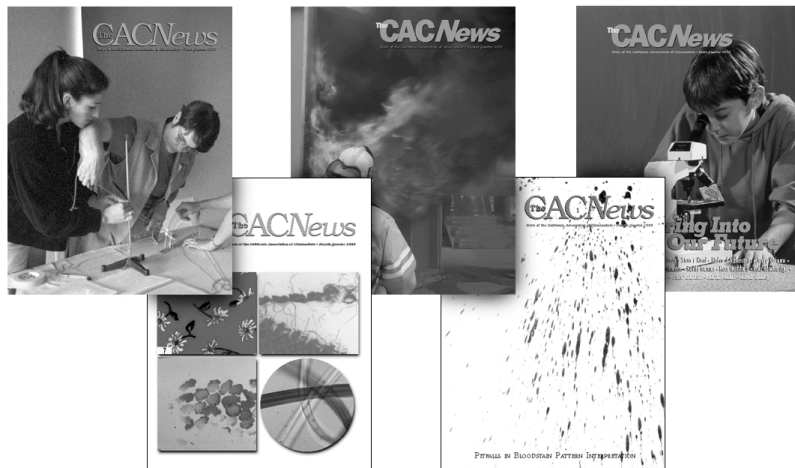
When I graduated from Jr. High School, a classmate wrote in my year book:

"May you know something about everything and everything about something."

That statement defines where we were and where we are going today in Criminalistics. We are, in my opinion, in a transition stage from one part of that approbation to the other. In the old days we "knew something about everything." We worked every aspect of the physical evidence from the crime scene to the courtroom. We advised the detectives regarding investigative leads and the prosecutors regarding how best to present the evidence.

I would like to tell you something about what we did in the laboratory. The methods may sound crude to you with

Keep in touch.



the instrumentation available to you now. You may think, "I could analyze those samples quicker and easier and have a better analysis than was possible with the methods used." But, remember my experience in looking at Roger Greene's 30 year old case, and could you do the analyses in each and every field. Don't be too quick to judge.

In serology, we went to crime scenes and collected the blood. We examined items submitted for stains and the patterns of those stains. We would use presumptive tests on the stains to determine if the material was blood. The primary presumptive test we used was benzidine³, we were totally ignorant of the consequences. We determined whether the blood was human or not using the precipitin test. Only then would we analyze for the ABO types.

First we would try the Latte's crust method, but it was a test for the antibodies and wasn't, therefore, reliable. If the case was important enough we would analyze it using the absorption inhibition test for the antigens. Blood typing took 2-3 days, then it wasn't always definitive. The absorption inhibition tests were so sensitive to contamination and error; they frequently had to be repeated.

We searched microscope slides for sperm similar to what is done now. Except we didn't use the Xmas tree stains, therefore, sperm were harder to find. We relied on the acid-phosphatase test more than we would like to admit.

In the trace evidence section, we vacuumed clothing, cars, beds, and rooms for trace evidence. We spent hours comparing the hairs and fibers under the microscope. If the fiber and the color was the same microscopically, then we called it a match. Of course, the variety of fibers wasn't so great as it is now. We didn't have an FTIR or a GC/MS to determine the absolute identity and we didn't try to identify the dyes, we didn't have instruments that were sensitive enough.

Glass and paint comparisons were similarly handled. We determined the refractive index and the density on glass. We compared color and layers on paint, sometimes, if there was only one layer, we did some basic chemical spot tests.

The week was interrupted by Blood Alcohols. We ran the Kozelka-Hine method of steam distillation with a mer-

curic oxide scrubber. The method was time consuming, taking, at first, a day to run 10 samples. Let me describe how we analyzed the samples.

The Kozelka-Hine apparatus was a series of seven rather delicate pieces of glassware, starting with a steam source at one end and a condenser at the other. The blood was orally pipetted into the first tube along with a measured quantity of a precipitating chemical. The steam passed through the sample into the HgCl/NaOH mixture, then to the condenser where it dripped into a carefully measured quantity of Potassium Dichromate in Sulfuric Acid. The flasks were sealed with a clamp and placed in the oven for an hour. The amount of Dichromate left was determined by titration with Sodium Thiosulfate with a KI indicator. The burette had to be filled and refilled for each sample by hand.

I used to break something about once a month. Those sidearm sintered glass tubes cost about \$40 then. This was at the time we used to wash our slides and even our coverslips to save money. I don't know how Tony put up with me, except that I was willing to do the BA's and he didn't have to.

Those of you running blood alcohol samples today should be thankful that technology created the means to abandon the Kozelka-Hine method.

We also did the coroner's toxicology. In San Bernardino, we analyzed blood, urine, and various organs for suspected poisons. When the DA requested, we would also analyze the low BA's for drugs. Using an acid/base extraction system with chloroform⁴ we analyzed the extracts on the UV spectrophotometer.

Jimmy Brackett had run all the known drugs and distributed the curves. Nobody worked in toxicology without a copy of that paper. The method became known as the Brackett and Bradford (two more of the Founders) or the B & B Scheme. To identify the particular barbiturate we used paper chromatography in gallon sized pickle jars, of course, this only worked when there was a high concentration of drug.

Drug cases weren't the full time job you have now. We only had a few a week, mostly marijuana or pills. Marijuana was visually identified under the stereoscopic microscope. A single fragment found in

the vacuum sweepings from a car was sufficient to seize the vehicle.

The most common pill was Secobarbital. We used crystal tests to identify the various barbs and amphetamine. Methamphetamine was almost unheard of, Heroin was a problem, cocaine was not. PCP, LSD, MDA, ETC. did not exist.

Sometimes, we couldn't identify the drug, I missed my first LSD case. It was on some sugar recovered from the mail. It wasn't until about 3 months later that we learned about this new drug and how it was used on sugar cubes. Fluorescence was the only test we had until Duane Dillon and John Thornton came up with the Siamese Fighting Fish Test. LSD made them swim upside down.

Footprints and tire-tracks were fairly common types of evidence, the comparison of shoe prints hasn't changed. Basically, the same science used in those days is used now. Except, you can scan a shoe or photo onto the computer and use overlay methods of analysis. In those days, we didn't even have copy machines, all reproductions were done photographically.

In firearms and toolmarks, we would fire guns into a cotton box, recover the bullets and compare them with the questioned. We used lead sheets to make our test marks for toolmark comparison. Our microscopes were similar in basic design to those used today. However, the Held Microscope we had in San Bernardino Lab had a single vertical eyepiece. The scope was so large that I could hardly reach the bullets to rotate them and keep my eye on the comparison.

We didn't photograph the matches. Not that we couldn't, we took photos of other things. We developed our own film and made our own prints. To send the film out was not acceptable. We used infrared photography to determine the presence of powder particles, a technique that has returned with some of the digital cameras.

Arson samples were steam distilled using an oil trap, which separated the organic fraction from the aqueous. If we were lucky enough to get an adequate sample we would burn it, if it ignited then, we concluded, a flammable liquid was present. At CCI, Roger Greene made a device to determine the flash-point. In the early sixties, the gas chromatograph

We can not be objective when the evidence we examine and the information we are furnished is biased by selection external to the laboratory.

became a common lab instrument. However, and this will cause you arson experts to shudder, some people were identifying gasoline on a series of only 5 peaks.

Many of us packed our own columns for our GC's. We found Tide was a good packing material for separation and identification of arson accelerants. It would separate the gasoline into about 40 or 50 peaks.

The chemical development of fingerprints was expected to be done in the lab, dusting, lifting and comparison work was also done in some labs. Most criminalists were capable and qualified in the field of latent prints.

The Founders of CAC did all those things and more.

If you worked in a crime lab in California you were expected to be able to do all of these analyses and to be able to testify about them and their significance in the case. We were expected to know something about everything. We were not experts in all those subjects, rather we were experts in the identification and interpretation of physical evidence.

The interpretation of the results in light of the case is what criminalistics is about. It is not adequate to run a test, technicians can run tests and write reports. To quote Paul Kirk, "A master of all techniques may remain merely a technician, and the best of all technicians is not necessarily a satisfactory criminalist. The criminalist must analyze the problem and understand the principle in order to arrive at the correct interpretation of the criminal act."⁵ and "The underlying understanding of what to do, and what it means is certainly as important as knowing how to do it."⁶

The CAC's definition of criminalistics at that time included the phrase, "criminalistics is ...that profession and scientific discipline devoted to the recognition, identification, individualization, and evaluation of physical evidence by the application of the natural sciences to matters of the law." The lab technician does not participate in the recognition or evaluation of the physical evidence.

The person who sees all the evidence is the trial attorney. Attorneys have their own agendas. They are partisans in the matter and as Plato said, "The partisan, when he is engaged in a dispute, cares nothing about the rights of the question, but is anxious only to convince his hearers of his own assertions."⁷ They want to convince the jury that the defendant is guilty or, conversely, not guilty.

They should not be the ones to decide the scope of the laboratory investigation. Yet as you give up this role, they are the ones taking it on. We can not be objective when the evidence we examine and the information we are furnished is biased by selection external to the laboratory.

I recently worked on a case where the prosecution's primary witness was shown to be lying by analysis of the bloodstains. The man was really afraid at the crime scene, but was too "macho" to admit it, so he made up a story wherein he was a hero. The physical evidence showed that the incident couldn't happen the way he stated. The jury said they realized this and didn't believe anything he said. If the prosecution had given their lab all the information in advance, they could have shown the lie and saved the expense and time of a lengthy trial. Instead they based their prosecution on the story of the lying witness. Therefore, they were partisan in what they told and showed the lab.

One cannot say they recognize physical evidence unless they go to the crime scene and collect their own evidence. Instead, we allow the evidence to be collected by the police then filtered through the district attorney. We cannot assume that we are unbiased in our examinations if our samples are biased to begin with. This is one of the dangers of not going to crime scenes, of not getting as much information about a case as possible before you start your analyses in trying to identify or individualize the evidence. However, you cannot recognize evidence at the crime scene unless you know something about the capabilities of the entire laboratory. You need to be a generalist.

This generalist concept is what the certification examination was based upon. The original Criminalistics Certification Examination was put together by the CAC. The Certification Board felt that the person should know something about everything. That concept was part of the package that the CAC sold to the ABC.

This remains one of the primary objections individuals have to certification, people want to take only the specialty exam, as they are imminently qualified in their specialty, but know little about the other sections of the laboratory. But this field should never become as Peter DeForest put it, a "poorly coordinated collection of specialists."⁸

The next generation, of which, I guess, I am, saw changes as technology developed and the analyses became more and more sophisticated. We contributed to that change; we were always seeking new and better methods for the identification and individualization of physical evidence.

We had time to examine a problem, to research it, come up with the right questions, and, subsequently, a solution. We would read something in the journals and give it a try. Don't panic, but sometimes we used actual case materials for those trials. The slide method of absorption-elution of bloodstain typing was developed that way.

I had just read an article about using an ammonia extract of blood for typing by

the absorption-elution⁹ method in the *Journal of the Forensic Science Society* when a colleague told me he had a case he needed to blood type by 7 am the next morning, it was 3 pm already. In those days, the methods of absorption-elution in use took at least 24 hours. I suggested trying a modification of the method I had just read about. It worked!

The antigen determination, in his case, took only about an hour. I later refined that method to get it down to 10 minutes and analyzed of several samples to show that it worked. But, we tried it first on a case sample. We didn't fear the consequences, if it worked we had an answer, if it didn't we were at the same point we were before we tried.

The point is we tried something and it worked. The generations of criminalists before you weren't so tied up in paperwork that they couldn't experi-

The generations of criminalists before you weren't so tied up in paperwork that they couldn't experiment, refine parameters, and try new methods . . .

We practiced criminalistics.

ment, refine parameters, and try new methods and ideas. We tried to determine the questions and the answers. We practiced criminalistics.

In his Founder's Speech Peter DeForest¹⁰ stated that the crime lab is relying more on technology and less on thinking through the problem. He blames part of this on the development of laboratories in the 70's because of federal funds. Too many labs were established along the lines of clinical labs. The clinical laboratory performs standardized tests on a limited range of sample types. The laboratory analyst has little discretion. The testing is based on the evaluation of someone external to the laboratory. In the clinical laboratory that person is at least a scientifically trained diagnostician. In the crime laboratory, that person is first the investigator and secondly the attorney. Neither of whom has a real knowledge of the sciences used in the lab. As Stuart Kind states in *The Sceptical Witness*, "Training people to think is more difficult than training them to operate machines."¹¹ By thinking he means in knowing how to think out a process or solve a puzzle. But, now the emphasis seems to be to make sure the crime lab scientist can operate machines correctly and gets the expected answers on proficiency tests.

Presently, criminalists or crime lab scientists aren't allowed to try new things, experimenting, developing and refining methodologies. We have to use standardized approved methods of analysis. We must show we are capable of getting the "right" answer to the analysis of a sample using those methods. We cannot use anything that varies from those approved methods in the slightest. In the past, we weren't restricted to approved methods. If we had been, you would still be using paper chromatography in pickle jars.

Don't take this to mean that I am not for accreditation and quality control. I wrote a paper for DOJ on quality control in the early 80's. It was rejected as being too strict and impossible to do. The things I recommended weren't nearly as stringent as those you must operate under for accreditation. The same people who rejected those suggestions went on to become the administrators involved in the new standards.

A couple of meetings ago, after a discussion about some of the things happening in accreditation, Tony asked me why I was against accreditation. I restate I am not against accreditation. I am

against the way it is being administered. I am against anything that threatens to destroy criminalistics, this field of endeavor that has been my life. I think that the way accreditation is currently being administered is doing exactly that, destroying criminalistics. When ASCLD LAB started and when the standards first came out, the program was to help those labs reach a minimum level of standards. I was very supportive of the program⁵. That "minimum level" has grown and grown, until it is a full time job in the lab to keep up with the myriad of things that need to be done to meet the criteria. The tail is wagging the dog. I've stood on this soapbox before and I will leave it for now, I am labeled a heretic anyway.

Let me turn to another area, how our development of new techniques has effected the field. I can remember Jimmy Brackett returning from an AAFS meeting, saying that one of the toxicologists told him that "we in the CAC were really ruining the field." They had been content to say there was a barbiturate in the blood. Then the criminalists in California developed methods to determine how much was present— and then to identify the specific barb. These developments caused the toxicology departments in the Midwest and the East so much more work they were having a hard time keeping up.

Once something is done that is more refined, whether it is a better quantitation or identification, it must continue being done. That is the nature of the field we work in. The legal profession constantly tried to make us try to improve upon the way we did our examinations. Now the legal profession is insisting that we follow approved methods.

In this transition period not only are you unable to develop methodologies, but many of you only work in only one discipline or section in the laboratory. There is a trade off; the amount of information you now generate from an item of evidence is far greater in establishing the identification and individuality of that item than what we were capable of doing. You are the other part of the quote, you "know everything about something." You are assisted in this knowledge base by the computer, storing information and automatically comparing it to a library of standards. This shortcuts the time necessary to find an answer.

Another advantage of specialization is that your qualifications in court are impressive. One of the tricks attorneys used on Paul Kirk was that they would ask him if he had qualified as an expert

on firearms, on blood analysis, on hair identification, on fiber identification, etc., etc. Then they would argue to the jury that no one could be an expert in all those fields. That can't happen when you are a specialist in only one discipline.

Being a specialist also has disadvantages. You no longer see all the information about a case. By not seeing all the information, you lose the ability to choose what tests to run. No longer can you advise the officer or the attorney that what they are requesting is not going to show what they want it to. The answer they seek is in a different area of the laboratory. An example would be the request to run DNA on a blood sample when there is no question as to whose blood is present, the pattern tells the story.

Time has become so much more precious than it was when I started. The caseload per criminalist has increased many fold. You don't have time at work to read the journals, or you only read the articles in your field. That is another reason why criminalistics is not being practiced as it once was. In the late 60's or early 70's MRI did a study of crime labs. They stated that the number of officers per bench criminalist should be no more than 60 to 1. What is it now? 300 to 1? How can you keep up with the work with that ratio? You can't, you probably don't work on burglaries or hit runs, certainly not dog poisonings or other misdemeanors. You haven't the time to consider anything but murders and sexual assaults.

Another problem with becoming a specialist is that you don't listen to what the specialists in other fields have to say. This is accepted in the American Academy by having sections. But, in the CAC we had a big loss by not foreseeing this trend early enough. One of the first special interest groups in criminalistics was toxicology. The toxicologists first requested that sections of the program be devoted to toxicology. Then Saturday was devoted to their specialty. Finally, they met at a different location, completely separate, one day of the meeting. The next step was to form their own association, the California Association of Toxicologists.

The CAC lost those persons and their successors. The analysis of drugs would possibly be easier if those minds were still working on the analysis of gross samples instead of just trace amounts. Will the same thing happen with DNA? or with Firearms? or Trace? You must guard against separating the special interest groups from the rest of CAC. I pray that it doesn't ever happen again. Perhaps

the CAC needs to consider the structure of the American Academy. While such a change in the structure the CAC would lose the original flavor of the organization, the whole will be intact. Even though it would also contribute to the loss of the generalist.

Will we continue to develop along the lines of the specialist? Will we continue to give up the ability to seek the right questions, only giving answers to someone else's questions? Perhaps the answer lies in history, if we look at the development of scientific investigation, we first find that there was considerable interest in the interpretation of physical evidence in the late 1800's. The stories about Sherlock Holmes and Dr. Thorndyke had to be based upon some of the practices of investigators of the times. Dr. Hans Gross wrote texts for both detectives and criminalists in the 1890's. This was a growth period in scientific investigation.

After the turn of the century, there was a lull period, there was little development regarding interpretation of evidence. Then a resurgence occurred in the late 20's and the early 30's. The first public crime lab was started and Ray Pinker was hired in Los Angeles in 1928. Henry T. F. Rhodes wrote articles and a text¹² on the use of science in interpretation of the evidence. Edward O. Heinrich, the Wizard of Berkeley¹³, turned his scientific and interpretative skills to the problems of criminal activity. This too was a growth period.

Then new technological developments such as the comparison microscope, new chemical methods, detracted from the development of interpretive skills. We entered another lull period until Paul Kirk became involved in the examination of physical evidence. He established first Criminalistics courses then the Program, at U.C. Berkeley. While he taught methodologies, he emphasized the reasoning skills that need accompany them. He and his students created an emphasis on the interpretation of evidence that lasted into the 70's. Then the influx of non-criminalistically trained people was added to the mix by the sudden growth of laboratories.

We are in a lull period again. The technology has become so advanced, the quality control so regimented, that interpretative skills are not emphasized. However, I believe we will recover from this lull, just as we have in the past. I think the criminalist of the future will have to have problem solving skills and will reform the crime labs again.

As I stated earlier, the District Attorney, with his partisan attitude is now tying everything together. There is a new group, a new "forensic science" called profiling. These profilers are looking at all the evidence and interpreting it for the courts. They claim they need a crime reconstruction prior to their analysis or assessment. Seldom, however, do they ask a criminalist to do this reconstruction. These people are doing it themselves; many of them don't know anything about the natural sciences. If not the Criminalist as we know it, then perhaps these people working in behavioral profiling will do the interpretation of our cases.

Or perhaps it will be the computer. I remember seeing a *Looney Tunes* cartoon several years ago wherein Daffy Duck and Porky Pig were detectives in the far future when space travel is common. They went to the scene of a crime and vacuumed the floor. They returned to Headquarters and dumped the debris into a computer. The name of the perpetrator, Yosemite Sam, and his location were printed out for the waiting detectives. While far from reality it would be great if the crime lab was involved in the investigatory stage and to provide meaningful answers to that phase.

I have high hopes for the future of criminalistics, but, then, I am an eternal optimist. A pessimist believes things will get worse, the optimist, by believing things will improve, is saying that things can't be worse.

In conclusion, I would like to try to answer the question I posed earlier, regarding why the founders created the CAC. This is also why, I have run for various offices and served on various committees. I was, in 1964-67 in the last of the full service one-man labs in California. I was in Bakersfield, which is over 100 miles from any of the other crime laboratories. I feel that my experience there gave me an understanding of the motives of the Founders. During that time, I attended every monthly dinner meeting in the South and a couple in the North. I attended every seminar. It wasn't that I was dedicated. But I used the CAC, and in retrospect, I think what the CAC fulfilled for me it fulfilled for the Founders.

- CAC provided me with professional companionship when I was lonely.
- CAC provided me people who could answer my questions.
- CAC provided me a forum for my ideas when I found something new.
- CAC provided me an outlet for

the extra things I wanted to do.

- CAC provided me the opportunity to grow.
 - CAC provided me fraternity.
- For those things, I am extremely grateful.

J.C.

NOTES

1. May 1961, Apple Valley Inn, Victorville.
2. Report regarding a dog shooting posted in the Classroom at CCI.
3. In 1971, Congress published the first list of 7 carcinogens, benzidine is on that list.
4. Chloroform is now also on the list of carcinogens.
5. I was President of ASCLD when the ASCLD LAB finished their study and set the standards. They were ready to start accreditation of the first lab.

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TRAINING & RESOURCES VIDEO

(CAC Members Only)

SEROLOGY / DNA

- S1 **Electrophoresis Basics**—Linhart • **Glycogenated Vaginal Epithelia**—Jones • Erythrocyte Acid Phosphatase — Rickard • Phosphoglucomutase —White / M. Hong
- S2 **Immunology** — Stockwell
- S3 **Gm / Km** —Stockwell / Wixall
- S4 **Peptidase A** —Yamauchi
- S5 **ABO** — Thompson
- S6 **Saliva**—Spear (incl DNA Kelly-Frye/Howard Decision)
- S7 **Presumpt. Tests/Species/ PCR Intro**—Peterson/Mayo
- S8 **Gc sub**—Devine/Navette
- S9 **Statistics**—M. Stamm
- S10 **Haptoglobin** — D. Hong
- S11 **Population Genetics & Statistics Course**—Bruce Weir
- S12 **Micro. Exam. of Sex Assault Evidence**—Jones
- S13 **DNA Workshop** — Spring 1993

CRIME SCENE

- C1 **Bloodspatter Lecture** —Knowles
- C2 **Bloodspatter Lecture** — Chisum
- C3 **Crime Scene Investigation Symposium**—Fall '88 CAC

GENERAL INTEREST

- G1 ABC News 9/23/91: "Lab Errors"
- G2 48 Hours 9/25/91: "Clues"
- G3 Founder's Lecture: Stuart Kind— Fall '93
- G4 Founder's Lecture: Walter McCrone—Spr '90
- G5 Founder's Lecture: J. Osterburg—Fall '91
- G6 Founder's Lecture: Lowell Bradford—Spr '93
- G7 OJ Simpson Tonight Show Clips
- G8 "Against All Odds—Inside Statistics"

ALCOHOL / TOXICOLOGY

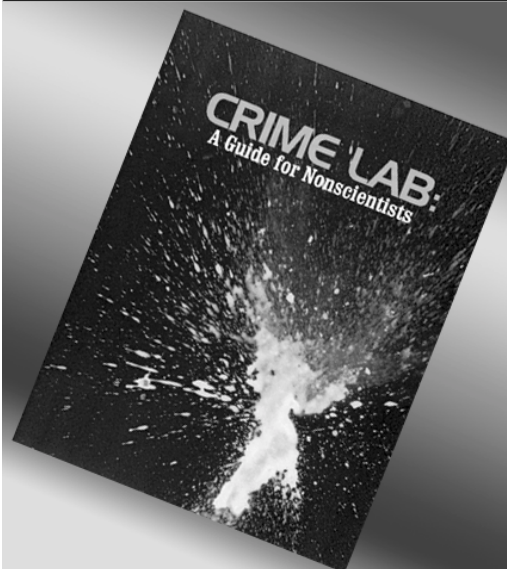
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JOHN SIMMS

Quality Assured

Reading the Label

Reading The Labels of QA Managers for the Ingredients

I am a QA manager. Some of you are. But what does that mean? What does a QA manager look like? How is a QA manager supposed to act? Recently, there has been a lot of discussion via the national network of QA managers on this issue.

First, consider the background of the criminalist. A criminalist brings to the table very specific work tools forged from an education in a physical science. Specialized training, both formal and on the job, helps to sharpen the criminalist's tools of the trade. Experience guides the judgment and execution of the work.

How does this play into the issue of the QA manager background? A criminalist or supervising criminalist is often assigned to the QA task while a few of us volunteer. It usually happens this way because of limited resources which have a double effect: 1) a QA manager almost always comes from within the staff since getting new budgeted positions is very difficult, especially if the positions are not geared towards casework. 2) a QA manager is rarely a dedicated position, having to usually double up on various tasks of QA as well as supervision and this in itself may pose an interesting conflict of interests.

As a consequence, most QA managers have a science background as well as forensic casework experience. There are some opinions that a true quality assurance manager should not come from forensic science as this poses another possible conflict of interest. The laboratory, advocated by some, should try to recruit someone from a quality field not related to forensics.

It seems clear, though, that having a forensic scientist in the QA manager position is of benefit to the communication with the staff. When the QA manager understands the science, the process is more streamlined. Alternative approaches to satisfying requirements may be easily identified. In the end, all are agreed that the QA manager must have specialized training and this is certainly available from the FBI and CCI.

Networking is a vital part of the QA manager experience as getting numerous perspectives on industry standards helps to reasonably shape QA policy in your own system.

QA managers often answer directly to the manager and sit within the management circles. One lab director emphasized



A QA manager must be patient and detailed enough to measure and assure compliance, but not so detailed as to cripple a work process.

that it is important for a QA manager not to be a "yes" person or someone who simply resides in management's pocket. The QA manager must, even in the face of disagreement, speak to the issues of QA requirements, realizing that any particular QA position may not be how "the boss" sees it. The QA manager must take, at the appropriate times, the unpopular position and push for unpopular changes. But the QA managers must also not be too stubborn in their opinion nor too obstinate in their disagreement. They have to be approachable and flexible enough so that consideration of alternative viewpoints can sometimes change their mindset.

A QA manager must be patient and detailed enough to measure and assure compliance, but not so detailed as to cripple a work process. The QA manager must be organized enough to be multi-tasked and efficient enough to track and monitor deadlines and various types of documentation which must be producible upon demand.

To be truly effective, almost everyone agrees that a QA manager needs to be dedicated to the task and not split between other laboratory functions.

A QA manager has to be able to write well enough so that the main points of a policy or procedure issue are clearly articulated, giving the best starting point for later edits by the boss. This is perhaps the most difficult quality to satisfy consistently since everyone has their own spin on any particular written phrase.

Finally, the QA manager must be able to persevere in the face of adversity, of conflict, of resistance, and of always having to

run the policy decisions through the lab manager. In fact, a QA manager may have less autonomy than a unit supervisor because QA issues cross unit boundaries and affect everyone. This is the jurisdiction of the lab manager and this is where the QA manager must be able first to articulate the issue and support for their viewpoint and then to realize when it is time to back off and say, "yes, boss." Different viewpoints are healthy and are encouraged. A good QA and lab manager team always work together to ensure that having to say "yes" to the boss will never mean sacrificing or compromising quality standards.

LESSON *cont'd from page 7*

find an equally comprehensive curriculum for DNA analysis.

Toxicology is well represented at Kings. The Drug Detection Center, located upstairs from my laboratory, is world renown. The scientists at the unit are International Olympic Committee accredited and have just returned from Sydney where they were in charge of drug testing athletes. These same experts will be teaching the Drugs and Toxicology module of the MSc program.

The main forensic science employer in England, Wales and Scotland is the Forensic Science Service. Its system is structured much like the California Department of Justice in that labs are located throughout the UK and managed by a central body known as the Home Office. Recently I attended a joint meeting of the Forensic Science Society and the Forensic Science Service held near the city of Birmingham. It was a pleasant surprise to have a fellow Californian in attendance—John DeHann, who was collecting yet another award for his work. The theme of the conference was “Crimes of the Millennium.” The intriguing Shipman case was presented in detail and to go into this superbly developed presentation would take another article altogether. Instead, I will focus on a presentation that afterward raised some thought provoking questions around my FSS dinner table.

The English have embarked on a new registration system for forensic practitioners. It is known as the Council for the Registration of Forensic Practitioners (CRFP). The CRFP is an independent regulatory body, whose objective is to promote public confidence in forensic practice in the UK. Like the ABC, registration is voluntary. It is worth pointing out that their Code of Conduct seems to be drawn up in a remarkably similar fashion to the CAC code. Although most everyone at the conference agreed that registering forensic practitioners is a positive step, the issue nevertheless raised some interesting questions.

Professor Brian Caddy, President of the Forensic Science Society, puts forth the following question: Does someone who

has searched a garment and recovered trace fibers which they then analyze, prepare a report for and present to the courts have the same registration status as someone who has extracted a DNA sample and run a gel? [1] Should a distinction be made between the forensic practitioner and the analyst/technologist when standardizing skills?

These and other questions were bantered about over a robust supper of Caesar salad, poached Scottish Salmon, seasonal vegetables and a curious dessert tradition from Scotland that I have to admit I was afraid to try called Spotted Dick, served with fresh cream or custard.

Before coming here, I had only a vague notion of what the British were like as a people, most of it perpetuated by media stereotypes. Were British men anything like the eerily editorialising Hitchcock on his half-hour television program or were they more like the suave James Bond? After living here myself, though, I would have to say that a local columnist described the difference between Yanks and Brits best this way. “As for the British, we never liked or trusted the people who want to become really rich and devote their lives to it. When Americans see a Rolls-Royce in the street, they want to meet the owner and congratulate him. We want to scratch it.” [2]

Another great thing about London is its proximity to the continent. For instance, the next FSS conference is in Amsterdam in the spring. Round-trip to Amsterdam is less than \$100. What could be better than seeing the world while following one's passion? For any of you who want more details about the program at King's, please feel free to contact me by email. I'll keep you posted on my progress through future CACNews articles. Cheers!

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Dianne Burns is a CAC member and is taking a one-year leave of absence from the DNA Lab in Berkeley to complete her MSc in London, England. diane.burns@kcl.ac.uk



Send us your Archives

The CAC is attempting to gather and catalog all of the archival documents and materials members have accumulated over the past 40-50 years. We're especially interested in board of director papers, membership documents and old photographs and videos.

MILLENNIUM SPRING CLEANING!

Ever run across CAC materials from committees, board meetings, seminars, etc.? You don't want to throw them away but you don't want to keep them until the next millennium. Members of the board and the historical committee would like to take those pesky materials off your hands. Please contact Lisa Brewer regarding reports, photographs, objects or anything else that is of interest to the CAC.

Lisa Brewer (408) 299-2224 x2575 lisa.brewer@crime.lab.co.santa-clara.ca.us

Distinguished Member Award 2001

CALL FOR NOMINATIONS

The Awards Committee is actively soliciting nominations from the membership to add to this impressive list of Distinguished Members: **GEORGE SENSABAUGH (1983) • PETER BARNETT (1992) • JAN BASHINSKI (1984) • JOHN MURDOCK (1993) • EDWARD BLAKE (1985) • JOHN DEHAAN (1994) • JIM WHITE (1986) • HIRAM K. EVANS (1995) • JERRY CHISUM (1987) • ANTHONY LONGHETTI (1996) • LUCIEN HAAG (1988) • FAYE SPRINGER (1997) • JOHN THORNTON (1989) • DUAYNE DILLON (1998) • DOROTHY NORTHEY (1990) • FRED TULLENERS (1999) • EDWARD RHODES (1991) • GREG MATHESON (2000)** Any member of the Association may nominate another member for this award. Please use the accompanying nomination form, or provide the necessary information.

Nominations must be received by April 1, 2001

Distinguished Member Award criteria: 1) The candidate must be a member of the CAC (in any category). 2) The candidate must have contributed significantly to the association in one or more of the following areas: A) Long term service to the association as a member of the Board of Directors and/or in committee(s). B) Sustained production of papers or technical notes in newsletters or at seminars. C) Organization of study groups or workshops, etc. D) Significant research and dissemination of the information to the forensic science community (i.e. journal or newsletter publications, seminar papers, workshops, study groups, etc.) E) Any other unusual or significant contributions to the improvement of the profession of criminalistics.

Distinguished Member Award 2001 NOMINATION FORM

Candidate: _____ Address: _____

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Contributions: Please be as specific as you can when describing how the candidate has met the criteria. For example, give dates of service and type of service to the CAC, full bibliographic information on papers, etc. Attach additional pages as required. If a curriculum vitae is available, please attach a copy to this form.

Name, address and phone number of nominating party:

Additional references:

1)

2)

Please return completed forms to:

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The Evaluation of ABACard® p30 Test for the Identification of Semen

Theresa F. Spear and Neda Khoskebari

Introduction

The ABA card p30 test was evaluated as a tool to characterize suspected semen stains. Our study focussed on the specificity and sensitivity of this test. As described by the manufacturer, Abacus Diagnostics, the ABACard p30 test is "designed to qualitatively detect prostate-specific antigen (p30) for the forensic identification of semen. PSA or p30 is an accepted marker for detecting semen in criminal cases including vasectomized or azoospermic individuals." The test has been characterized by the manufacturer as: "Highly sensitive & specific to PSA... Validated for use in the forensic identification of semen."

The ABA card p30 test is simple to perform. The test is comprised of a plastic card with two "windows". One of these windows allows the sample (typically 200ul) to be applied to the test membrane and the other window permits the analyst to view the antigen-antibody reactions. The sample can be extracted in distilled water or a variety of buffer solutions (HEPES buffered saline or "buffers suitable for further DNA extractions"). The stain extract is centrifuged and allowed to come to room temperature before application to the card. The test requires 200ul of this stain extract to be added to the sample ("S") well of the test device. Thus, the minimal amount of buffer solution to extract the stain should be at least 200ul. After this solution is added to the sample well, it reacts with a mobile monoclonal PSA antibody (with an attached dye) forming an antibody-antigen complex. This PSA- PSA antibody complex then migrates across the test device membrane to the test area where an immobilized (polyclonal) antihuman PSA antibody captures the first antigen-PSA antibody (presumably formed in or near the "S" well). This reaction (an antibody-antigen-antibody sandwich) is visualized as a purple-colored band formed by a dye attached to the mobile antibody. Above the test area (marked "T" on the device) is a control area (marked "C" on the device) which captures unbound mobile antibody by the use of an immobilized anti-immunoglobulin antibody. The control band (which controls for proper sample migration) needs to be visible in order to interpret a test result. A positive test is a purple band in the control and test areas. A negative test result is a purple band in just the control area. An invalid test result is a result without a band in the control region.

Literature Review

In a paper entitled: "Evaluation of Prostate-Specific Antigen Membrane Tests for the Forensic Identification of Semen" (J. For. Sci. 44, 1057-1060, 1999), Hochmeister and his collaborators described the results of their evaluation of this product. The samples they used were semen stains stored at room temperature for up to 30 years, post-coital vaginal swabs, "male and female body fluids" and previously analyzed casework

semen samples (spermic and aspermic). They did not obtain positive reactions from any body fluid samples obtained from women. Semen stains stored up to 30 years still produced a positive test for p30 with this test. They also determined that a semen sample which had been diluted 1:1,000,000 could elicit a positive result for p30. With the exception of a liquid urine sample from male volunteers (applied directly to the test device), the only positive reaction that they observed was from semen samples. They did obtain false negative reactions from very concentrated semen samples and attributed this to the "high dose effect". These samples tested positive when they were diluted 1:100 or 1:1000.

The Northern Illinois Police Crime Laboratory also undertook a validation of the ABA card p30 test. This study was entitled: "The Validation of the OneStep ABA Card PSA (p30) Test for the Forensic Identification of Semen" and was presented at the 9th International Symposium on Human Identification. They determined that a spermic semen sample diluted 1:1000 could produce a positive reaction and a 1:100,000 dilution of an aspermic semen sample could produce a positive reaction. They found that although the ABA card p30 test was more sensitive than a p30 test by the crossover method, it was less sensitive (for a spermic sample) than a microscopic examination for sperm. They noted that their acid phosphatase (AP) results frequently correlated with the results they obtained with the ABA card p30 test.

Finally, an evaluation performed by the Texas Department of Public Safety, entitled: "Analysis of the ABA card OneStep PSA Test For Use in the Forensic Laboratory" details its findings on this test using diluted semen, body fluids other than semen, washed semen stains and semen stains extracted with a variety of buffers (from pH 4 to pH 10) and with glycerol. They were able to detect the presence of semen diluted more than 1:800,000 using the ABA card p30 Test. Vaginal swabs, blood and urine all produced negative reactions for p30. However, saliva samples produced an "invalid" test result on some occasions and a false-positive reaction on another occasion. A washed semen stain tested negative. A diluted (1:10,000) semen sample still produce a positive test result in a pH 4, pH 7 and pH 10 solution. Mixtures of saliva and semen appropriately produced positive reactions with the ABA card P30 test.

Experimental Findings

In the present study, we evaluated both the sensitivity and specificity of the ABA card p30 test using human semen samples, human bloods and human body fluids other than semen (urine, saliva and semen-free vaginal swabs). Most of the samples were prepared by saturating a cotton swab with the sample and allowing it to dry. The samples were stored frozen until they were extracted with 100 ul of deionized water, placed into a spin basket and centrifuged to recover a fairly concentrated body fluid stain extract. For most of the samples in this study, 10ul of this water extract was then added to 290ul of deionized water. The final step was to add 200 ul of this diluted sample to the test device. The test results were recorded at 2 minutes, 5 minutes and 10 minutes after sample addition. A control line was obtained with all of the tests run during this study and all of the test results were interpreted.

Sensitivity

Positive test results were obtained on a liquid semen

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Sacramento, CA 95820

sample diluted 1:10,000. At the 1:100,000 dilution, a negative test result was obtained. This indicates that the test is relatively sensitive.

Tom Keener at the DOJ - Chico laboratory determine that the SERI semen standard could be diluted 1:100,000 and still produce a strong positive result using the ABA card p30 test. When this sample was diluted 1:1,000,000 a relatively weak positive result was obtained.

Specificity

All unmixed, semen stains tested in this study produced positive reactions. Semen samples from 5 different subjects all showed a positive "T" and "C" band. A weak "T" band was noted with some of these concentrated samples. Dilution of one of these samples produced a stronger "T" band.

Post-coital swabs (all containing semen) showed mixed results. Positive test results were obtained on swabs with the following indicated post-coital intervals: 30 minutes, 2 hours and 24 hours. Negative test results were obtained on post-coital swabs (with semen) showing the following indicated post-coital intervals: 24 hours, 48 hours (2 swabs), 72 hours and 105 hours.

All 11 saliva samples (from 4 males and 6 females) tested produced negative results with this p30 test.

Bloodstains from six different people (1 female, 5 males) produced only the "C" band indicating a valid, negative test for p30.

Tom Keener at the DOJ-Chico laboratory determined that 3 plasma samples (from males) which had been diluted 1:100 and one, undiluted plasma sample produced negative results for p30 with the ABA card p30 test.

None of the 11 urine stains (from 4 males and 6 females) that were tested produced a positive reaction with the ABA card p30 test. This included one "post-ejaculatory" urine stain. However, when Tom Keener tested 4 liquid urine samples (2 males, 2 females), the two male samples produced a positive test reaction while the two female samples produced a negative test reaction.

None of the 6 semen-free, vaginal swabs (from 6 females) that were tested produced a positive reaction for p30.

Of the 6 blank samples (consisting only of deionized water) that were tested, one "blank" sample showed a weak positive test result. This sample was re-tested with another p30 test and a negative reaction was obtained. This could mean that there are card-to-card differences in the same lot. This false-positive phenomenon was seen again when deionized water extracts from 3 fabric "unstained" controls (newly purchased/washed fabric) were applied to p30 test cards and were found to elicit a very weak positive band at the "T" area. A new set of fabric "unstained" controls were prepared with deionized water and again produced a set of weak (false) positive reactions. When a portion of this fabric was sent to Tom Keener at DOJ-Chico for testing, negative results were obtained. The need for running appropriate negative controls with this test is apparent.

Discussion

The ABA card p30 test is easy to perform and requires a minimal amount of equipment (centrifuge, timer and pipettes). This test is also easy to interpret: a purple line at the control test area and at the test area is a positive result. A valid, negative result is a single purple line at the control area. The instructions that are included with the kit warn of a "High Dose

Hook Effect" which may result in a false- negative result if the semen sample is too concentrated. As in any test relying upon an immunological reaction, if the antigen concentration in the sample is too concentrated, the antigen will saturate the antibody and prevent the "antibody-antigen-antibody" sandwich from forming. This will result in a false- negative reaction. We observed two concentrated semen samples that produced a weak positive result. When one of these samples was diluted, the positive result ("T" band) was stronger. If it appears likely that a stain may be a concentrated semen stain (e.g. produces a strong AP test), it would be a good idea to test the sample using the standard stain extraction protocol and a 1:100 dilution of this stain extract.

The only body fluid (other than semen) which produced a positive test result with the ABA card p30 test was liquid urine samples (applied directly to the test device) from males. None of the urine stains (including a "post-ejaculatory" urine stain) tested in this study produced a positive test result. Saliva stains, vaginal swabs, and bloodstains all produced negative results. Although none of the bloodstains tested in this study produced a positive test response, it could be anticipated that a blood sample from a male with prostate cancer could elicit a positive response with this test device.

Positive results were obtained on post-coital swabs (containing semen) with a post-coital interval of up to 24 hours. Although one swab with a 24-hour post-coital interval tested positive for p30 using this test, all of the swabs with post-coital intervals more than 24 hours were negative. This would not be the test of choice to use to identify semen from a sample that was likely to reflect a long post-coital interval (more than 16 hours). This finding is probably not surprising in light of information in the literature (An Evaluation of Gamma-Glutamyl Transpeptidase [GGT] and p30 Determinations for the Identification of Semen on Postcoital Vaginal Swabs, JFSCA, Vol. 30, No. 3, pp. 604-614) which indicates that p30 is not usually found on post-coital swabs taken 16 (or more) hours post-coitus. Spermatozoa are a more stable marker for the identification of semen (with sperm) from a swab with a post-coital interval of more than 16 hours.

The most problematic results obtained with the ABA card p30 test were the weak positive results obtained with one "blank" and several "unstained controls". These samples produced a relatively strong "C" band and a relatively weak "T" band. These "blank/unstained" samples were simultaneously tested with other body fluid tests with negative results. There was no indication of contamination of these samples with any human body fluids. Although pH, temperature and "viscosity" can impact test results, all of the samples tested were extracted in deionized water and run at room temperature. It is not known what caused these particular results. It is important that negative controls (blanks / "unstained" controls) be run at the time suspected semen stains are being tested for p30 with the ABA card p30 test.

Unfortunately the intensity of the bands can not be considered in test interpretation. The manufacturer indicates that the intensity of the test band "T" and the control "C" band "should not be compared to each other for OneStep ABACard p30 Test and no quantitative interpretation should be based upon differences in the intensity. The appearance of both lines merely proves the presence of p30." It appears that based upon these instructions, an analyst would need to call any test result showing both a "C" and "T" band positive for p30. However the manufacturer of this test also states (in the product insert):

"Even if the test result is positive, careful forensic judgement should be made in conjunction with other information available from other testing and diagnostic procedures." Due to reports of positive results from saliva samples (Texas DPS), possible reactions from concentrated male urine samples and weak false-positive reactions from sample that do not contain human body fluids, this test can not be considered a "stand-alone" test for the identification of human semen. The analyst must have other supporting information from chemical or immunological or microscopic tests to make a conclusive determination of the presence of semen.

The cost of each test device is approximately \$4.00/test. This test can be obtained from Abacus Diagnostics, 6520 Platt Ave. #220, West Hills, CA 91307 Phone (818) 716-4735.

Acknowledgement:

The staffs of the BFS-Chico, BFS-Fresno Laboratory and the BFS-Riverside Laboratory supplied validation test results and many of the samples needed to perform this evaluation.

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Feedback *continued from page 10*

creator got from his "sources at LVPD" and real or imagined, these impressions were the basis of the show. In LVPD's defense, some people only hear what they want to hear on certain topics, this may have been a major factor with the creator also.

Let's look at the context of the show from an entertainment standpoint and not in our ivory tower of all things forensic and perfect. 17.3 million viewers watched a show about criminalistics and continue to make it the number one new drama of the season. An incredible amount of research goes into every story line and scenario, with experts being consulted on issues all over the country. It is the most highly researched program on TV. Very popular shows like NYPD Blue and Law and Order don't even mention criminalists or give them a moment on screen, yet I'll bet most CAC members have enjoyed an episode or two of each of these top rated shows. Is it real? No. But we all watch.

Perhaps this show can clean up the only reference "Middle America" has of criminalists which is the OJ Simpson Case. Clearly the interest is there. Be realistic, if they followed John Q. Criminalist around the lab or at a crime scene with a TV camera, the viewer would quickly go make that sandwich or get that beer. How would this play out for sweeps week: our heroes go to a crime scene and collect evidence...the promo would be "Next season on *CSI* we will find out where the evidence takes us." WHO WOULD WATCH THAT? *CSI* crams weeks/months of work into a 48 minute episode. That's not accurate either but that's TV. This isn't a Frye hearing and the TV lab doesn't have to be accredited, so the time cheats are there, and I grant you they are there whenever a technical occupation is portrayed on TV. Ask any ER doctor if that show is accurate. We are not special in this respect.

To quote Hugh Miller the author of "What a Corpse Revealed": "If a book (or a TV show in this case) of factual information is to attract a readership, humdrum elements must be vigorously trimmed. Most cases handled by Forensic scientists are anything but spectacular, the description of colourless routine has no power to divert." The show does speed things up so the audience can stay focused on the story, they don't have to sit through peer review and data analysis and all the other tedious things we need to do. This isn't jury training, It is entertainment.

People want to know what we do and how we do it, but they also want to be caught up in the mystery. *CSI* is a mystery show with a forensic lens not the other way around. The viewer wants the suspense, intrigue and cool science. Lets face it, the most exciting part of DNA analysis is not the long tedious extractions, instrument runs and data analysis, it is the results. That's what the audience wants, Forensics intertwined with the story. I have told the writer's repeatedly that the criminalists do not interview, if you notice in later episodes our crims are still asking questions, but our detectives are present and involved. The evolution of more accurate forensics is one of my goals with the show, but this is a business. There are many people involved in the making of a television show all who have a tremendous amount of money at stake. My input is a very small part of the whole scheme.

I think the forensic field should be glad that there is a show on TV that is loved by the layman about criminalists. It is a flashy, fun program with good music and allot of glitz. OK admittedly I don't look as good as Marg Helgenburger in my jumpsuit and John, you are no Billy Petersen...It is Hollywood. If you want accuracy watch a documentary, if you want a fun diversion, watch *CSI* and remember....That's Hollywood.

Elizabeth M. Devine

Spring 2001 CAC Seminar: May 7 – 12, 2001

The First CAC Seminar of the New Millenium

Preliminary Information

97th Semi-Annual Seminar, Granlibakken Resort and Conference
Center at Lake Tahoe, Tahoe City, CA
Victor Reeve, Seminar Chair, California Criminalistics Institute,
Room A-104; 4949 Broadway, Sacramento, CA 95820
(916) 227-3575 • fax: (916) 454-5433 • email: reevev@hdcdojnet.state.ca.us

About the Location: In Norwegian, Granlibakken means "a hill sheltered by fir trees." This resort and conference center combines breathtaking surroundings and rustic lodging to create a unique atmosphere of inspiration and relaxation that will certainly enhance the Spring 2001 CAC Seminar. The appeal of this location attracted ski enthusiasts dating back to the 1920's. The Olympic tryouts were held there in 1932 and Junior Olympics in 1952. University of California Alumni built the original main lodge in 1958. In 1989 and 1995, new conference facilities and an executive lodge were completed.

Daily conference center package rates include one night's lodging, full breakfast, lunch and dinner plus use of meeting and recreational facilities. Recreational opportunities (depending on season) include: river-rafting, lake cruises, golf, mountain biking, skiing, ice-skating, hiking, tennis, swimming, horseback riding, a par course, etc.

Workshops:	Microscopy of Rape Workshop	(3 Days: Monday – Wednesday, May 7 – 9th)
	Adobe PhotoShop® Workshop	(2 Days: Monday – Tuesday, May 7 – 8th)
	Fluorescein Workshop	(1 Day, Monday, May 7th)
	GHB and Related Compds Workshop	(6 Hours, Monday, May 7th)
	Donner Party Archeology Workshop	(6 Hours, Tuesday, May 8 th)
Computer Based Training –		
	Bloodborne Pathogens Workshop	(4 Hours, Wednesday, May 9th)
	DNA Workshop	(1 Day, Wednesday, May 9th)
	Courtroom Testimony	(4 Hours, Wednesday, May 9th)
	Footwear Impression Evidence Forum	(2 Hours, Wednesday, May 9th)

Meeting Theme: *Learning Opportunities for Forensic Scientists in the 21st Century*

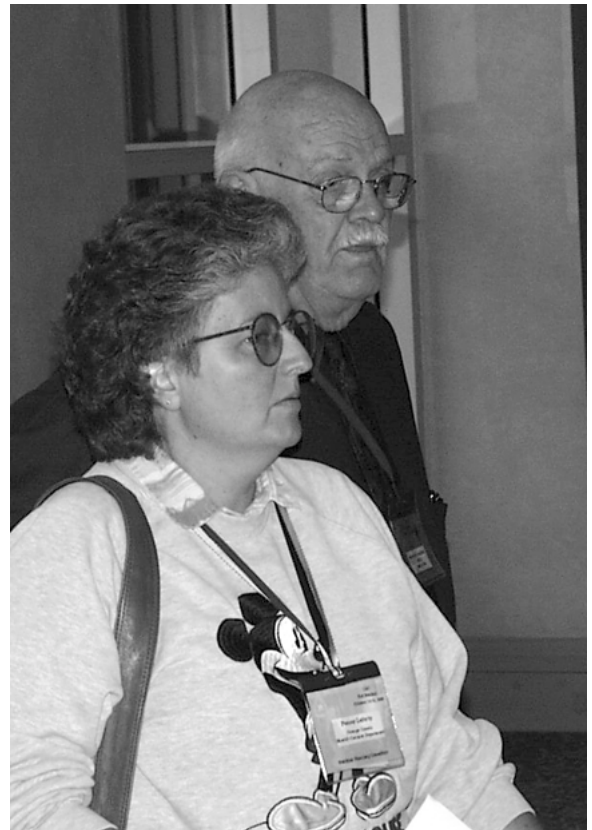
Technical Presentations and Poster Session: Abstracts for presentations and posters are currently being accepted. Topics already offered for potential inclusion into the technical program or poster session include:

The Evidential Portable Alcohol System (EPAS) • Analytical Profiling of Clandestinely Manufactured Methamphetamine • New Features Available through the CCI Virtual Library and Its Sherlock Search System • Twin Firing Pin Impressions • SEM vs. Light Microscopy • Elemental Analyses • Clandestine Synthesis Utilizing 1-Phenyl-2-Nitropropene • An Interesting Crime Scene That Required Blood Spatter Pattern Interpretation

Additional Meeting Features: Keynote Speakers to Address Meeting Theme • Banquet • Vendor Displays and Introductions • CAC Board Meeting •
New Members' Orientation • CAC Business Meeting • ABC Examinations

Glendale

2000



The 96th semi-annual CAC semi-

nar was held in Glendale this October, and proved to be a feast for the eyes and ears (and noses?) Although the majority of the event was located at the Glendale Hilton, Cal State LA played host to a key workshop.

The CAC board of directors met prior to the general meeting, President Lisa Brewer leading the way while Editorial Secretary Nancy McCombs and Regional Director North Annie Murphy listen with rapt attention (*top right*).

Weighty topics were pondered by Past President Hiram Evans and Treasurer Michelle Fox (*below right*).

The opening ceremonies were begun with remarks from James Kelly, dean of the school of Health and Human Services, Cal State LA. After a welcome from Seminar co-Chair, Tony Longhetti (*with Pennie Laferty, near left*), each of the vendors and exhibitors introduced themselves, including Dick Rogers of EviPaq, a regular supporter of our seminars (*far left*). Former DOJ criminalist and current ThermoQuest sales rep Duane Mauzey was observed chatting with former L.A. Coroner Thomas Noguchi during one of the generous breaks (*middle left*).





Hog Wild

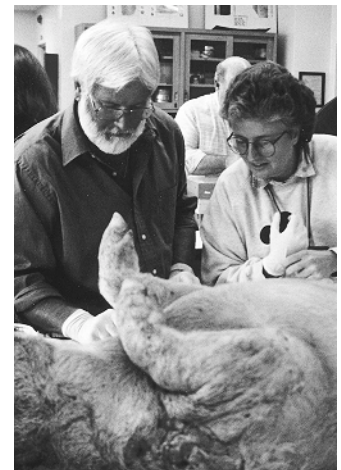
There's little doubt about which workshop became the most talked about (and joked about) at the 96th semiannual seminar: *Forensic Entomology* was the deceptively sedate sounding title. Bugs. But the workshop, taught by Dr. M. Lee Goff, of Hawaii, was by far the winner of the most unusual, if not the most pungent category.



CAC Past President Hiram Evans had the dubious honor of procuring the hog carcass which weighed approximately 135 pounds, and letting it sit staked to the ground in his rural backyard. He reports that he got some strange looks from neighbors as he allowed the hog to "ripen" and attract insects over the course of the next few days. The weather at his high altitude home was particularly cold, even to the point of snow, but wasn't so cold as to deter a bear from clawing the carcass at least once, he says. By the end of the workshop, students were able to collect and identify not only several species of insect, but



also correctly identify the stage of development the insect was in. This skill would be useful in gaining additional clues about the time of death.

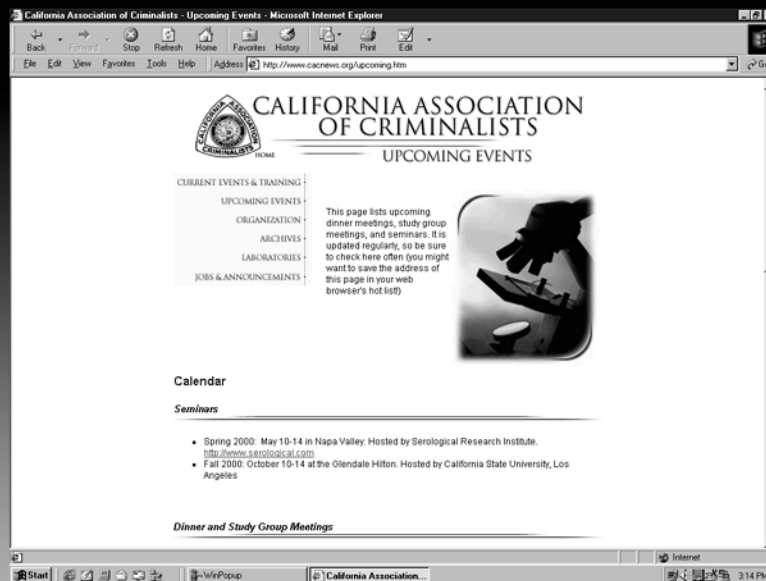


Hiram Evans and Marty Fink hoist the hog carcass (in a body bag) from the back of a pickup on to a wheelbarrow (*top, middle left*). Dr. M. Lee Goff demonstrates the succession of insect sorms present on decaying flesh as a few workshop attendees hold their noses.



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it's just about us

Contemporary Russian 7.62x39mm Ammunition

Lucien C. Haag

ABSTRACT

Substantial quantities of ammunition in 7.62x39mm have been, and continue to be, imported into the United States from a number of countries due to the large number of firearms chambered in this caliber. Some novel design and construction features have taken place over the last few years among former Soviet-Russian manufactures of military ammunition. Careful examination and disassembly of cartridges in 7.62x39mm imported into the U. S. during this period has revealed features that set them apart from all other sources of ammunition in this caliber and even distinguish the factory or origin in the present day Russian Republic.

The recognition of these features by the laboratory examiner stands to provide useful information to both the laboratory and investigators confronted with crimes involving such ammunition.

KEYWORDS: Russian ammunition, 7.62mm bullets, 7.62x39mm, M43, AK47, SKS, hunting bullets, steel jacketed hollow point bullets, plastic base plug, polyethylene, Barnaul, Tula, Ulyanovsk

INTRODUCTION - HISTORICAL INFORMATION

The 7.62x39mm Russian cartridge (properly called the M43 but commonly referred to as the AK47 cartridge) was adopted by the Soviet Union shortly after the World War II. The first production rifle chambered for this new cartridge was the semi-automatic SKS45 carbine. This rifle was quickly superseded by the selective fire AK47. Other so-called East Block countries allied with- or armed by the Soviet Union adopted the same or similar rifles chambered for the M43 cartridge. Communist China and a number of Arabic countries also produced military guns in this caliber. The cartridge is now manufactured in a number of countries including the United States.

Large numbers of obsolete, surplus SKS carbines were imported into the U.S. from Communist China, Russia and a number of former Communist block countries. Their low cost, robust nature, modest recoil and generally acceptable accuracy made them very popular with recreational shooters. Semi-automatic clones of the AK47 were also made for importation by these same countries. The relative low cost of foreign-made 7.62x39mm ammunition coupled with the desire by many to own a piece of the "Evil Empire" has resulted in large numbers of semi-automatic rifles and carbines being imported and sold in the U.S. It should come as no surprise that some members of the criminal element in American society have also made these guns a popular choice.

DESIGN FEATURES AND BALLISTIC PROPERTIES

The M43 round is considerably less powerful than the standard battle cartridges of World War II. It is a cartridge of

intermediate size and power- more powerful than the 30 M1 Carbine cartridge but less powerful than the .30-30 Winchester cartridge developed near the end of the 19th Century. The standard bullet weight for the M43 cartridge was slightly less than 8 grams (122 gr.) Muzzle velocities for this bullet fired from SKS carbines and AK47 assault rifles are typically 2300 f/s to 2400 f/s (720 m/s). Although described as 30 caliber bullets, they typically measure .310 in. to .311 in. (7.87mm-7.90mm) in diameter rather than .308 inches. This is in keeping with groove diameters of Soviet 7.62mm rifles.

The overall length of the M43 bullet is about 1.045 in. (26.5mm). The center of gravity for the M43 Soviet ball round is about 9mm forward of its base. The G_1 ballistic coefficient for this bullet is approximately 0.30.

In accordance with the military practices of virtually all countries in the 1940s and thereafter, the Soviet M43 bullet was of full metal jacketed design and possessed a spitzer point. A mild steel core (rather than a lead core) was employed in the M43 service round. This core is about 0.775 inches (19.7 mm) in length and 0.226 in. (5.74 mm) in diameter with a flat point and is both centered and secured inside the mild steel bullet jacket by means of a lead sheath of about 0.020 in. (0.5 mm) thickness. This core weighs about 55 gr. (3.57g).

This hard, non-deforming bullet is one of the most ballistically stable rifle bullets in existence and as a consequence, it often produces entrance and exit wounds in gunshot victims that look more like wounds from full metal jacketed pistol bullets than so-called high velocity wounds. This ballistic stability increases the likelihood of surviving a gunshot wound from one of these bullets as compared to a soft point .30 M1 Carbine bullet, a .30-30 Winchester bullet or even a hollow point pistol bullet fired into the same area of the torso. This is not necessarily undesirable from a military standpoint since the wounding of ones adversary rather than the outright killing of him will tie up more of the enemy due to the need to treat and remove the wounded soldier from the battlefield.

Much, if not all, of the Soviet service ammunition possesses a clear red lacquer sealant at the junction of the bullet and the cartridge case mouth. Vestiges of this lacquer often survives the discharge process and can be seen in the groove impressions of recovered bullets. Most other sources of military 7.62x39mm ball ammunition do *not* possess this lacquer sealant.

POLITICAL-LEGISLATIVE EVENTS

The anti-firearms ownership political climate that arose in the U.S. following several tragic multiple shootings by deranged gunmen took a number of irrational and emotional courses during the last decade and a half. Most imported 7.62x39mm ammunition was built around the Soviet model and possessed bullets with steel cores. This ammunition was deemed armor-piercing ammunition by certain American politicians and policy makers. That this is untrue did not dissuade the federal government and BATF from banning the importation, sale or transfer of such ammunition in 1987. Ironically, this resulted in specific design changes in Russian-made 7.62x39mm ammunition which produced more lethal (but legally importable) ammunition. This ammunition is the primary subject of this paper.

MANUFACTURING CHANGES

Following the collapse of the Soviet political system, the

Forensic Science Services, Inc., P.O. Box 5347, Carefree, AZ 85377

This paper was presented at the Spring 2000 combined meeting of the California Association of Criminalists and the British Forensic Science Society held in Napa, California, May 2000.

desire to obtain hard currency and the import ban on steel core bullets, Russian ammunition manufacturers replaced the steel core with lead so their products could once again be imported and sold to the substantial shooting fraternity in the U.S. Both the surplus military ammunition (with the steel cores) and the redesigned ammunition was significantly cheaper than ammunition manufactured in the U.S. so there was a ready market for the imported Russian ammunition.

The early version of the new Russian bullet simply involved replacing the entire interior of the same mild steel bullet jacket with lead. This produced bullets weighing 140 gr. \pm 2 gr. rather than 122 gr. bullets. The jackets of these bullets weigh 33 gr. and the lead cores weigh 107 gr. The external shape and dimensions of the bullet remained the same as the M43 ball round although the faint impressed cannellure found in the military bullets was missing in the 140 gr. projectiles. The author obtained a number of these redesigned FMJ-BT bullets as reloading components.

It is unclear if any of these bullets were ever loaded in Russian 7.62x39mm cartridges and imported into the U.S. but their outstanding characteristic is that they are much heavier than the standard M43 bullet or any of the subsequent replacements. The greater weight is, of course, due to the greater density of lead compared to steel. It should also be noted that the muzzle velocity of these bullets stands to be lower than the lighter 122 gr. bullets if the peak pressures are to be kept within the normal limits of approximately 38,000 psi (2775 kg/cm²). Tests in FSSI's 7.62x39mm pressure/velocity system revealed that the loading of these 140 gr. bullets with the same powder charge as for the standard service load used in the standard 122 gr. M43 bullet produced an average peak pressure of 52,000 psi (3800 kg/cm²) and velocities on the order of 2400 f/s (732 m/s). Pierced primers (due to excessive pressure) also occurred when these over-weight bullets were loaded with the same charge of powder as for the lighter 122 gr. bullets. Some limited testing indicated that muzzle velocities on the order of 2100 to 2200 f/s (ca. 650 m/s) would be produced by cartridges loaded within normal peak pressure limits.

This modification (the complete replacement of the steel core and centering sheath with lead) would logically simplify manufacturing procedures and cost of production but the over-weight nature of these bullets must have caused the Russian manufacturers some concern because in the early 1990s a new bullet appeared in imported Russian 7.62x39mm ammunition.

RUSSIAN "HUNTING" AMMUNITION AND BULLETS

In the mid-90s 20-round boxes of Russian 7.62x39mm ammunition appeared labeled "for Hunting Purposes."

When these cartridges first appeared in gun stores, the headstamps were typical Russian military (arsenal code at 12 o'clock and year at 6 o'clock). More recently they have had symbols and English lettering such as TCW (Tula Cartridge Works) and "WOLF" after the American importer of 7.62x39mm cartridges manufacturer at the Tula factory.

The hollow point "hunting" bullets were constructed with the same mild steel jacket with a gilding metal wash, nose profile and open boat tail base. It was clear that the Russians had simply cut off the tip of their military bullet. There was also some semantic confusion on their part because some of the early cartridge boxes included the word "ball" which denotes a military style full metal jacketed bullet. An example of this is shown in one of the photo-illustrations appended to this article.

The weight of these bullets was back to 122 to 123 gr. (7.9 - 8.0 g). This was achieved in a most novel way. Lead core material weighing approximately 88 gr. (5.7 g) had been inserted into the mild steel jacket followed by a plug of translucent polyethylene plastic weighing approximately 1.5 gr. (0.1 g). This plug can be seen at the open base of these bullets. Because of its translucent nature and the underlying lead core material, it looks like lead but closer inspection under the stereomicroscope and/or probing it with a needle will quickly reveal the plastic nature of this material.

To date (September 2000) this design is uniquely Russian and therefore of special forensic value.

The exterior ballistic performance of these bullets appears normal out to considerable distances based on multiple firings and trackings with Doppler radar carried out at the U.S. Army Proving Grounds in Yuma, Arizona. **Table 1** provides a highly abbreviated printout of a Weibel Doppler radar track of an M43 bullet fired at a departure angle of +5° from an SKS carbine. The twenty-two rows of data out of the 1024 actually recorded should provide the reader some idea of the wealth of information available with this technology. A shot fired from the same carbine and at the same +5° departure angle with a round of the TCW (Tula Cartridge Works) 122 gr. JHP-BT bullet gave the following results:

Muzzle velocity of 2411 f/s (734 m/s)
2057 f/s (627 m/s) at 100 meters
1770 f/s (540 m/s) at 200 meters
1294 f/s (394 m/s) at 400 meters
539 f/s (164 m/s) at 1869 meters (2044 yds) + *ground impact* with an angle of fall of -9.8°

Note: the nominal G₁ BC for this bullet in the supersonic range (derived from the Doppler radar data) was calculated to be 0.28 which is essentially the same as the standard M43 bullet (0.29).

Somewhat more detailed exterior ballistic data for the Tula JHP-BT bullet is given in **Table 2**.

The *terminal* ballistic performance of these hollow point bullets in tissue and tissue simulants is erratic. Because of the steel jacket and the small hollow point cavity, these bullets often fail to expand. In this situation they act like a full metal jacketed bullet. When they do expand, they frequently fragment rather than mushroom like a copper jacketed hollow- or soft point bullet. When they expand and fragment in a body, the plastic base plug may separate from the base of the jacket and be left in the wound track. It will only be found through luck or special diligence on the part of the forensic pathologist since it is totally transparent to x-rays.

The recovery of one of these plastic base plugs means the bullet associated with the injury came from a 7.62x39mm cartridge, it was of Russian manufacture and made during the 1990s.

The packaging of these "hunting" cartridges and others that have followed has undergone a number of interesting changes and refinements during the 1990s and has ultimately ended up with colorful 20 round boxes from at least four Russian manufacturers- the names of which are derived from the towns or districts in which they are located. These are the Tula factory about 50 miles south of Moscow, the Ulyanovsk factory about 550 miles east of Moscow and the Klimovsk factory (about 25 miles south of Moscow) and the Barnaul factory in Southern Siberia. The military code numbers for these and other Russian ammunition plants along with a description of actual

bullets disassembled from individual cartridges are given in **Table 3**. A more complete listing of Soviet and post-Soviet Russian ammunition factories is given in **Table 4**.

A more recent design change in the Russian "hunting" bullets and full metal jacketed bullets has been discovered which I shall call *New Millennium* Russian 7.62x39mm Ammunition since it started appearing in January 2000.

The multi-step requirements to assemble the previously-described "hunting" bullets with the lead core and plastic base plug must have been troubling to the Russians because the new bullets represent a simplification. The author's first encounter with one of the new "hunting" bullets was immediately after New Year's Eve-2000 when a Phoenix homicide detective brought this writer a pristine 7.62x39 JHP bullet recovered from a person that had been struck and slightly injured shortly after midnight by a falling bullet (as determined from the nature of the wound, the path of the projectile and absence of any nearby gunshots). The recovered bullet possessed the expected 4-right rifling characteristics of the SKS/AK series of firearms and vestiges of clear red sealant about midway up the bullet and in the groove impressions. The astute detective had also noticed that the hollow point cavity was very deep and not like previous examples of Russian "hunting" bullets. Simple examination of the open base of this bullet under the stereomicroscope also showed a lead core rather than the plastic base plug. These features were found to be in agreement with some WOLF brand ammunition (manufactured by the Tula factory) and recently purchased by the author. A lengthwise sectioning of one of the WOLF brand JHP bullets quickly revealed the reason for the deep hollow point cavity and the exposed lead base. The Russians had redesigned the hollow point "hunting" bullet to eliminate the plastic base plug yet keep the bullet weight at 122 gr. (7.9 g). The overall bullet length was also unchanged as was the gilding metal coated mild steel jacket, the open, boat tail base and the ogive shape. The weight had been retained by forming an internal shelf or ledge inside the steel jacket against which an appropriately sized lead core was inserted through the open base of the bullet jacket. The weights of this new jacket and core arrangement were 33-34 gr. (2.1 g) for the jacket and about 89 gr. (5.8g) for the soft lead core. The various features of this new bullet and other Russian 7.62x39mm bullets are described in **Table 3** along with the other *Novi Russ* bullets.

Pressure and velocity values (as measured with the Oehler PBL system) were approximately 2400 f/s (732 m/s) and 39,000 psi (2847 kg/cm²) respectively for the WOLF brand ammunition in both hollow point and full metal jacketed versions.

The exterior ballistic performance of these bullets with their aft center of gravity has yet to be examined by this writer. Doppler radar tracks are planned for December 2000. The reader is advised that a copper jacketed version of the WOLF product line has also been noted in some recent advertising literature but yet to be examined by this writer.

Several other Russian entries into the non-military style bullets appeared in sporting goods stores in the late 1990s. One of these was a jacketed hollow point with an open flat base with a rolled heel and manufactured by the factory in Ulyanovsk. The jacketing material was mild steel with a gilding metal coating. No cannelure or crimp groove was present nor were the bullets lacquer-sealed at the case mouth. The headstamp on these cartridges was "7,62x39 98" with a unique symbol denoting the Ulyanovsk factory. This symbol is also

depicted on the blue and white, 20-round cartridge boxes which describe the contents as "hunting cartridges" loaded with 124 gr. bullets. Additional details regarding these bullets can be found in **Table 3** and the photo-illustrations appended to this article.

The second entry comes from the factory at Barnaul. These bullets, loaded in steel cases headstamped "7,62x39 0 98" including a unique symbol for the Barnaul plant, consisted of closed base, jacketed soft point bullets with exposed lead at the tips. The jacketing was, once again, mild steel with a gilding metal coating, no cannelure but a clear red lacquer sealant at the case mouth. The closed, flat base was slightly concave. The 20-round red, white and blue cartridge boxes describe the contents as "Hunting Rifle Cartridges".

SUMMARY

A number of interesting and presently unique bullet designs loaded in 7.62x39mm cartridges are coming out of factories in Russia. These are clearly for export and the design variations are an effort to comply with U.S. import requirements for small arms ammunition as well as to simplify earlier efforts to meet these import requirements.

The unique design features described and illustrated in this paper should alert the firearms examiner to the forensic value of such characteristics in instances where such ammunition is used for criminal purposes.

Photographs of these bullets and the cartridge boxes are appended to this article.

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4. Crumley, Ron, "Headstamps of 7.62x39mm Cartridges", *AFTE Jour.* 30:1 (Winter 1998) p. 124 gives the following codes for Russian ammunition: 3, 17, 38, 60, 188, 270, 304, 539, 711, TN3 (should be T 3) Ty a aTpoH 3aBo (Tula Patronii Zavod =Tula Cartridge Factory)
5. Personal communication with Nikolai Victorovich Martinnikov - Ballistics Unit, MVD Laboratory, Moscow

TABLE 1

7.62x39 122 gr. FMJ-BT (M43)
YPG* DOPPLER RADAR TRAJECTORY RESULTS

muzzle elevation : +5.00 deg							
DATA PT.	TIME ms.	VEL. m/s.	VEL. mach	X-DIST m	Y-HEIGHT m	Z-OFF. m	SLANT DIST. m
Muzz	0.0	727.90	2.1204	0.00	0.00	0.000	0.00
50	313.7	551.86	1.6079	197.89	16.87	0.272	198.61
100	618.4	435.30	1.2685	346.84	28.75	0.469	348.03
150	923.1	352.66	1.0278	465.82	37.42	0.619	467.32
200	1227.9	308.29	0.8986	565.46	43.83	0.738	567.16
250	1532.6	285.16	0.8314	655.37	48.74	0.839	657.18
300	1837.4	270.08	0.7876	739.86	52.47	0.930	741.72
350	2142.1	256.44	0.7481	820.07	55.12	1.011	821.92
400	2446.8	244.22	0.7127	896.38	56.75	1.083	898.18
450	2751.6	233.20	0.6808	969.20	57.42	1.148	970.90
472	2885.7	228.54	0.6674	1000.20	57.41	1.174	1001.85
500	3056.3	222.58	0.6502	1038.77	57.16	1.206	1040.35
550	3361.1	212.55	0.6213	1105.21	56.03	1.256	1106.63
600	3665.8	202.90	0.5935	1168.67	54.05	1.300	1169.92
650	3970.5	193.90	0.5677	1229.32	51.27	1.338	1230.39
700	4275.3	184.97	0.5421	1287.25	47.72	1.370	1288.14
750	4580.0	176.37	0.5176	1342.51	43.45	1.397	1343.21
800	4884.8	167.83	0.4933	1395.18	38.49	1.418	1395.71
850	5189.5	160.30	0.4719	1445.33	32.89	1.435	1445.71
900	5494.2	153.31	0.4522	1493.23	26.67	1.446	1493.47
950	5799.0	146.85	0.4342	1539.07	19.82	1.454	1539.20
1000	6103.7	140.85	0.4176	1582.97	12.37	1.457	1583.02

The Table 1 bullet had a muzzle velocity of 727.9 m/s (2388 f/s) and was fired with a departure angle of +5 degrees.

The mean sea level elevation of the gun position was 182 meters (199 ft. MSL). It was tracked out to 1602.9 meters where it was traveling 138.19 m/s (453 f/s) after 6.25 seconds of flight and was still 8+ meters above the terrain. Its angle of fall at this distance was calculated to be -10.50 .

This bullet became transonic at a distance of 481 meters (526 yards) after 0.966 seconds of flight.

At a distance of 1000 meters (the bold entry in the table) the bullet's velocity had dropped to 228.5 m/s after 2.886 seconds of flight.

The G1 ballistic coefficient for this bullet based on the first 200 meters of flight was 0.29.

The maximum range for an M43 round fired at a departure angle of +37 degrees was 2747 meters (3004 yards) after a 27.3 second flight.

*YPG = Yuma Proving Grounds, Yuma, Arizona

TABLE 2**7.62x39 122 gr. JHP-BT (Tula mfg. - plastic base plug)****ABBREVIATED EXTERIOR BALLISTIC RESULTS**

from

YPG DOPPLER RADAR TRACK #101 12/5/98

muzzle elevation : +5.00 deg

DISTANCE	VEL.		FLIGHT TIME	CALC. G ₁ B.C.
m	m/s	(f/s)	sec	
muzzle	710.6	(2331)	0.0000	-
100	606.9	(1991)	0.1530	0.257
200	520.5	(1708)	0.3318	0.281
300	444.0	(1457)	0.5403	0.280
400	378.0	(1240)	0.7830	0.264
500	330.3	(1084)	1.068	0.258
1000	242.7	(796)	2.858	0.305
overall avg. B.C. = 0.285				

Gun position 199 ft. MSL, temperature 600F, Relative Humidity 40%, barometric pressure 998.5 mbs

TABLE 3
CONTEMPORARY RUSSIAN 7.62x39mm BULLETS

HEADSTAMP- YEAR of MFG.	SOURCE	BULLET DESCRIPTION	PROPELLANT
17 76	Barnaul Machine-Tool Factory	123 gr. FMJ-BT, steel core, 1.05" OABL, red lacquer	tubular
3 93	Ulyanovsk Machine-Tool Factory	125 gr. JHP-BT, lead core, 1.00" OABL, plastic base plug, rolled heel, open base	flattened ball
3 94	Ulyanovsk Machine-Tool Factory	124 gr. JHP-BT, lead core, 1.01" OABL, plastic base plug, heel not rolled, open base	tubular
3 96	Ulyanovsk Machine-Tool Factory	124 gr. JHP-BT, lead core, 1.00" OABL, plastic base plug, rolled heel, open base	tubular
711 93	Klimovsk - Moscow Region	125 gr. JHP-BT, lead core, 1.01" OABL, plastic base plug, rolled heel, open base	flattened ball
711 94	Klimovsk - Moscow Region	121 gr. JHP-BT, lead core, 1.01" OABL, plastic base plug, rolled heel, open base	flattened ball
7,62x39 —	Tula Cartridge Factory (— — — — —)	123 gr. JHP-BT, lead core, 1.02" OABL, deep HP cavity, very shallow cannelure at 0.33" heel not rolled, lead flush at open base	flattened ball

TABLE 3 (cont'd)
CONTEMPORARY RUSSIAN 7.62x39mm BULLETS

HEADSTAMP- YEAR of MFG.	SOURCE	BULLET DESCRIPTION	PROPELLANT
7,62x39 TCW* *inverted	Tula Cartridge Works	122 gr. FMJ-BT, lead core, 1.05" OABL, red sealant, heel not rolled, lead flush at open base	tubular
7,62x39 WOLF* *inverted		122 gr. JHP-BT, lead core, 1.02" OABL, deep HP cavity, very shallow cannelure at 0.33" with red sealant, heel not rolled, lead flush at open base	tubular
7,62x39 98	Ulyanovsk Machinery Plant	126 gr. JHP-FB, lead core, 0.876" OABL, open base with recessed lead core	tubular
7,62x39 0 98	Barnaul Machine Tool Plant	125 gr. JSP-Concave Base, lead core 0.867" OABL, shallow square-cut cannelure at 0.16" above base, red sealant	tubular

TABLE 4
SOVIET AND CONTEMPORARY FACTORY CODES
ON RUSSIAN SMALL ARMS AMMUNITION
(military pistol and rifle cartridges)

Russian Factory Code	Name - Location
3	Ulyanovsk Machine-Tool Factory
17	Barnaul Machine-Tool Factory (Southern Siberia)
29	Ulyanovsk Machine-Tool Factory
38	Youryouzan Mechanical Factory
46	Sverdlovsk (Ekaterinburg)
60	Frunze (Bishkek)
188	Novosibirsk
270	Lugansk* (Ukraine)
304	Moscow-Kuskovo
529	N. Lyalya - Sverdlovsk Region
539	Tula Cartridge Factory (So. of Moscow)
541	Cheljabinsk
543	Kazan
545	Orenburg
710	Podolsk - Moscow Region
711	Klimovsk - Moscow Region
904	Lugansk* (Ukraine)
911	Lugansk* (Ukraine)

Note: pre-revolution codes for St. Petersburg are 09, 13, 14

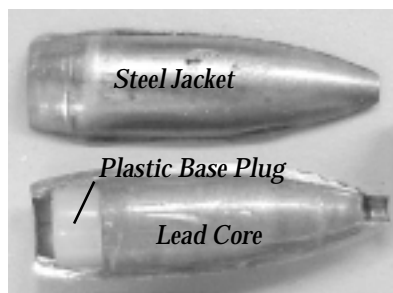
*The Ukrainian factory at Lugansk has gone out of business according to the author's contact in Russia.



**Sectioned Soviet
M43 Ball Round**



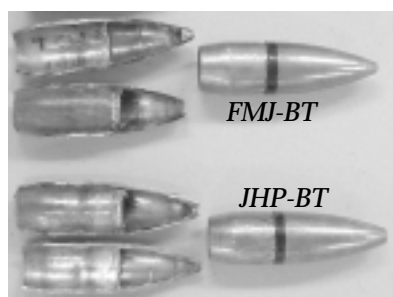
**Oblique base views of
the H.P. bullet from
Ulyanovsk (left) and
the jacketed soft
point bullet from
Barnaul (right)**



**First Generation
Sectioned "Hunting"
Bullet**

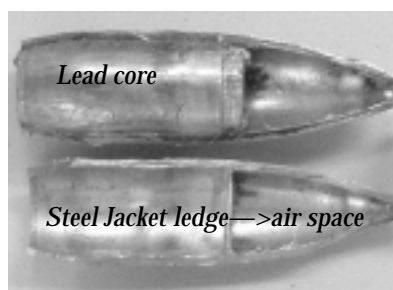


**Representative
headstamps
on Russian
"hunting"
cartridges**



**Sectioned full metal
jacketed bullet and
"hunting" bullet
manufactured at
Tula and imported
by "Wolf"
ammunition**

1. Soviet style headstamp: 3=Ulyanovsk 94=1994 year of manufacture bullet=123gr JHP-BT with plastic base plug
2. Barnaul 125gr JSP, 1998 manufacture (note symbol at 12 o'clock)
3. Ulyanovsk 124gr JHP, 1998 manufacture (note symbol at 4 o'clock)
4. "WOLF" Tula 122gr JHP-BT, current (1999-2000) production



**Second generation
sectioned bullet:
Closeup view**



**Representative cartridge boxes
for Russian ammunition**

Top row: Early development of hollow point loadings in 7.62x39mm. Note description on the middle box—"HP L.C.B. 123 BALL--" All of these boxes contain 122-123gr. JHP-BT bullets with plastic base plugs. Bottom row: Recent (1999-2000) entries from Ulyanovsk, Barnaul, and Tula.



**Jacketed hollow
point bullet from
Ulyanovsk (top)
jacketed soft point
bullet from Barnaul
(bottom)**



**Closeup views of
cartridge box end
flaps showing
factory logos that
are included in the
headstamps on the
cartridges.**

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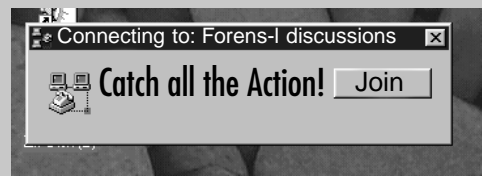


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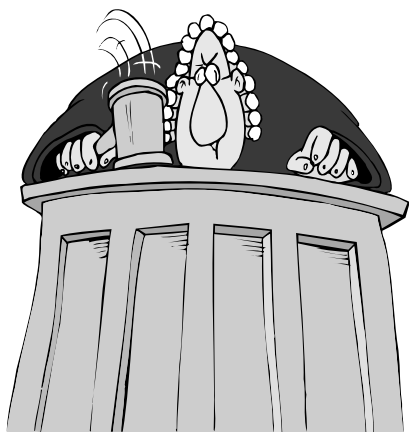
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Courtroom Calamities

Lawyer: "Have you ever made a mistake?"

Criminalist: "I hope so."

Lawyer: "What?"

Criminalist: "The last person who didn't make a mistake they crucified!"

-Anonymous

As I was approaching the stand the button fell off my shirt and I tried to ignore it during testimony. Later when I told the DDA what happened he said, "Oh, I thought that was just your style."

-Jennai Lawson

Attorney: "Is slurring of speech an indication of the consumption of alcohol?"

Criminalist: yyyyy...eeee...ssss

-Jerry Massetti

Attorney: "From where did you receive your degree?"

Criminalist: "UC Santa Barbara"

Lawyer: "Oh, the party school. Is that where you learned to be an expert in alcohol?"

-As told about a criminalist by Pennie Laferty

I was late for court so I ran right in and raised my hand to be sworn in:

Judge: "No, your other right hand."

-Iqbal Sekhon

Before testifying on a DWI case, I informed the DDA I might have to leave the witness stand to use the facilities due to a nasty stomach flu. After taking my seat, the DDA informed the judge and jury that I was experiencing diarrhea and projectile vomiting and might have to leave to throw up (among other unspeakable things.) I was mortified. I never had a jury more interested in the possibilities of my demise rather than in my testimony.

-Raymond Davis

A big-city California lawyer went duck hunting in rural Texas. He shot and dropped a bird, but it fell into a farmer's field on the other side of a fence.

As the lawyer climbed over the fence, the elderly farmer drove up on his tractor and asked him what he was doing. The lawyer responded, "I shot a duck and it fell into this field, and now I'm going to retrieve it."

The old farmer replied, "This is my property, and you are not coming over here!"

The indignant lawyer said, "I am one of the best trial attorneys in the U.S. and, if you don't let me get that duck, I'll sue you and take everything you own!"

The old farmer smiled and said, "Apparently, you don't know how we do things in Texas. We settle small disagreements like this with the Texas Three-Kick Rule."

The lawyer asked, "What is the Texas Three-Kick Rule?"

The Farmer replied, "Well, first I kick you three times and then you kick me three times, and we continue, back and forth, until someone gives up."

The attorney quickly thought about the proposed contest and decided that he could easily take the old codger. He agreed to abide by the local custom.

The old farmer slowly climbed down from the tractor and walked up to the big city lawyer. The first kick of his heavy work boot was planted firmly between the lawyer's legs, causing the lawyer to drop to his knees in agonizing pain. The second kick nearly wiped the man's nose off his face.

The lawyer was flat on his belly, clutching his groin in agony and bleeding profusely from an obvious broken nose, when the farmer's third kick to the kidney nearly caused him to pass out.

The lawyer summoned every bit of his will and remaining energy, managed to slowly get to his feet and said, "Okay, you old coot! Now, it's my turn!"

The old farmer said, "No, I give up. You can have the duck."

Via the 'net. (Last one to touch it was Bob Blackledge!)

Darwin awards

(Marty Fink says one wins this award by dying in a spectacularly dumb way. Honorable Mention to those proposed for nomination but ruled ineligible because the potential nominee lived in spite of life-threatening foolishness.)

Paul Stiller, 47, hospitalized in Andover Township, NJ, and his less seriously injured wife Bonnie. In an effort to relieve boredom, Mr. & Mrs. Stiller were driving around a suburban neighborhood at 2:00 in the morning. They lit a quarter-stick of dynamite intending to throw it from the car to create a bit of excitement. According to Mrs.

Siler, they failed to notice that the car window was closed.

Kerry Bingham of Tacoma, Mr. Bingham and several friends were drinking when one claimed to know a person who had once bungee-jumped from the Tacoma Narrows Bridge. About 4:30 AM, 10 men trooped along the walkway to the midpoint of the bridge where they realized that no one had brought a bungee rope. Bingham spied a coil of lineman's cable lying in a construction area and volunteered. The cable was secured around Bingham's leg and tied to the bridge. He fell 40 feet before the wire tightened and cut his foot off at the ankle. Although he survived the icy river, Bingham's foot was never located. At the hospital, Bingham was quoted "All I can say is that God was watching out for me. There's just no other explanation for it."

DETROIT, MICHIGAN: In an ill-fated attempt to retrieve his car keys, a 41-year-old man squeezed headfirst through an 18-inch-wide sewer grate. He became stuck. It rained. He drowned when the sewer filled to a depth of about 2 feet.

SAN FRANCISCO, CA: a 49-year-old stockbroker who, according to his wife, "totally zoned when he ran" jogged off a 100-foot cliff.

BUXTON, NC: Daniel Jones, 21, of Woodbridge, VA, was vacationing on the outer banks when he decided to dig an 8-foot-deep hole in the sand. He was sitting in a beach chair at the bottom of the pit when it collapsed burying him beneath 5 feet of sand. It took rescue workers using heavy equipment an hour to free him. Jones was pronounced dead on arrival at a hospital.

DAHLONEGA, GA: ROTC cadet Nick Berrena, 20, was stabbed to death when he challenged fellow cadet, Jeffrey Hoffman, 23, to have at him with a bayonet in an ill-conceived attempt to prove to Hoffman that Kevlar body armor affords protection from knife as well as bullet wounds. (It doesn't)

AND THE WINNER OF THE DARWIN AWARD FOR 2000:

PADERBORN, GERMANY - Zookeeper Friedrich Riesfeldt was killed while attempting to give his constipated elephant an olive oil enema. Prior to administering the enema, the overzealous Riesfeldt had administered 22 doses of animal laxative and had fed the plugged-up pachyderm more than a bushel of berries, figs and prunes. Flabbergasted Paderborn police detective Erik Dern gave the following explanation of the incident to local reporters: The relieved beast unloaded on him like a dump truck full of mud. The sheer force of the elephant's unexpected defecation knocked Mr. Riesfeldt to the ground, where he struck his head on a rock and lay unconscious as the elephant continued to evacuate his bowels on top of him. The-fated Friedrich, 46, suffocated under no less than 200 pounds of poop!

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