California Association of Criminalists NEWSLETTER

JULY 1986

Also enclosed with this mailing:

1. Abstracts, 67th Semi-Annual Seminar, May 15-17, 1986, Concord, California
2. Correspondence and transcripts from the Board of Review on the Bower case
3. Analytical methods course announcement
4. Awards Committee announcement and nomination form

CONFERENCES AND SEMINARS

THE NINTH ANNUAL VEHICULAR HOMICIDE/DWI CONFERENCE
July 27-31, 1986.
Contact, Registrar, The Traffic Institute, Northwestern University, P. O. Box 1409, Evanston, IL 60204.

FORENSIC ADMINISTRATION CONFERENCE
July 28-31, 1986
St. Louis University School of Medicine, St. Louis, MO. Contact Mary Fran Ernst, Division of Forensic and Environmental Pathology, St. Louis University School of Medicine, 1402 S. Grand Avenue, St. Louis, MO 63104. (314) 854-6500.

INTERPRETATIONS-URINE, THC AND THE DUI DRIVER
August 2, 1986.
This one day course is sponsored by the California Association of Toxicologists. It will be given in San Diego. For additional information, contact T.J. Butler, M.D., Associated Pathologists Laboratory, 4230 S. Burnham Avenue #250, Las Vegas, NV, 89119. (702) 733-7866.

AMERICAN CHEMICAL SOCIETY'S DIVISION OF CHEMISTRY AND THE LAW - COMMITTEE ON FORENSIC CHEMISTRY
September 9, 1987
A two part seminar on "The Role of the Forensic Scientist as an Expert Witness" and "Clandestine Drug Laboratories: A New Cottage Industry" will be presented at the ACS Fall National Meeting in Anaheim, CA, on September 9, 1987. For further information, contact Mark A. Farley, Esq., Pennie & Edmonds, 1155 Avenue of the Americas, New York, NY 10036. (212) 790-6542.

BLOODSPATTER WORKSHOP
September 8-12, 1986
A bloodspatter workshop will be sponsored by the Midwestern Association of Forensic Scientists from September 8-12, 1986, in Minneapolis, MN. For further information, contact Bart Epstein or Terry Laber, Minnesota Forensic Laboratory, 1246 University Avenue, St. Paul, MN, 55104. (612) 642-0700.

SOUTHERN ASSOCIATION OF FORENSIC SCIENTISTS
September 10-13, 1986
Auburn Conference Center, Auburn, Alabama. Contact Carlos Rabren, Alabama Department of Forensic Sciences, P. O. Box 231, Auburn, AL 36831. (205) 887-7001.

CANADIAN SOCIETY OF FORENSIC SCIENCE
September 15-19, 1986
The annual conference will be held at the Sheraton-Brock Hotel, Niagara Falls, Ontario. Contact Joanne Cottingham, Canadian Society of Forensic Science, 2660 Southvale Crescent, Suite 215, Ottowa, Ontario, Canada. 613-731-2096

NORTHWEST ASSOCIATION OF FORENSIC SCIENCE
October 8-10, 1986
The NWAFS Fall meeting will be held at the Red Lion Riverside, Boise, Idaho. Contact Pam Server, Forensic Section, Bureau of Laboratories, 2220 Old Penitentiary Road, Boise, ID 83712. (208) 334-2231.

MIDWESTERN ASSOCIATION OF FORENSIC SCIENTISTS
October 8-10, 1986
The 15th Anniversary meeting will be held in Springfield, Illinois. For further information, contact Ted Elzerman or John Klosterman, Illinois Department of State Police, Bureau of Forensic Sciences, 726 South College Street, Springfield, IL 62707. 217-782-4649.

CALIFORNIA ASSOCIATION OF CRIMINALISTS
October 8-11, 1986
Gene Autry Hotel, Palm Springs, California. For further information contact Faye Springer, CA Department of Justice, P. O. Box 3679, Riverside CA 92519 (714)781-4170.

(continued on page 3)

CONFERENCES AND SEMINARS (continued)

SOFT/CAT MEETING
October 29-November 1, 1986
A joint meeting of the Society of Forensic Toxicologists and the California Association of Toxicologists will be held October 29-November 1, 1986, at the MGM Grand Hotel, Reno, NV. For further information, contact Norman A. Wade, California Department of Justice, Bureau of Forensic Services, Sacramento, CA, 94203. (916) 739-5123.

FORENSIC SEROLOGY: DETECTION, COLLECTION, PRESERVATION AND ANALYSIS
November 11-12, 1986.
This course is being sponsored by the Michigan State University, School of Criminal Justice. Contact, Paul S. Embert, School of Criminal Justice, 560 Baker Hall, Michigan State University, East Lansing, MI 48824.

INTERNATIONAL ASSOCIATION OF FORENSIC TOXICOLOGISTS
July 1987
The 8th Triennial meeting will be held in Banff, Alberta, Canada. For further information, contact N. Dunnett, Home Office Forensic Science Laboratory, Aldermaston, Berkshire, RG7 4PN, UK.

INTERNATIONAL ASSOCIATION OF FORENSIC SCIENCES
August 2 - 7, 1987
Vancouver, British Columbia, Canada. Contact International Association of Forensic Sciences, 801-750 Jervis Street, Vancouver, B.C., Canada V6E 2A9. 604-681-5226.

THE THIRD INTERNATIONAL MEETING OF THE PAN AMERICAN ASSOCIATION OF FORENSIC SCIENCES
August 10-14, 1987.
The conference will be held at the Holiday Inn Plaza, Wichita, KS. For further information, contact Dr. William G. Eckert, P.O. Box 8282, Wichita KS 67208.

40TH ANNUAL MEETING OF THE AMERICAN ACADEMY OF FORENSIC SCIENCES
February 15-20, 1988.
This confernce will be held at the Wyndham Franklin Plaza, Philadelphia, PA. Contact AAFS, 225 South Academy Blvd., Colorado Springs, CO, 80910. (303) 596-6006.

41ST ANNUAL MEETING OF THE AMERICAN ACADEMY OF FORENSIC SCIENCES
February 20-25, 1989.
This confernce will be held at the Riviera Hotel, LSs Vegas, NV. Contact AAFS, 225 South Academy Blvd., Colorado Springs, CO, 80910. (303) 596-6006.

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COURSE TO BE OFFERED

ANALYTICAL METHODS IN FORENSIC CHEMISTRY

A course which will review current analytical methods as they are applied to forensic problems is being developed for the Spring, 1987, semester at California State University at Fullerton. The organizers of the course would appreciate suggestions from potential attendees as to the topics which should be covered in such a course. Please see the announcement with this Newsletter for further information. Contact Terri Beam, Orange County Sheriff-Coroner, P.O. Box 449, Santa Ana, CA, 92702. (714) 834-3073.

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JOB OPENINGS

(Job openings are obtained from a variety of sources. Given publication deadlines and delay in receiving announcements from other parts of the country, some of the openings announced here may be filled by the time this Newsletter is received. Job announcements will normally be run only one time. Members actively seeking employment are encouraged to contact the editorial secretary for information about openings which become available between newsletters.)

CRIMINALIST I
The City of Tucson is looking for a Criminalist for an entry-level position. Qualifications required are experience analyzing material in a Criminalistics Laboratory, a degree in Chemistry, Physics or a closely related field, or a combination of education and experience which provides the desired knowledge, skills and abilities. Staring salary is $1916/mo, increasing to $2451/mo. Contact Irene Wong, Personnel Analyst, City of Tucson, City Hall Annex, P.O. Box 27210, Tucson AZ 85726.

SENIOR FORENSIC BIOLOGIST and HEAD, FORENSIC LABORATORIES
The Department of Health, N.S.W., Australia, seeks an individual to manage the Forensic Biology Laboratory. Relocation expenses to Glebe, Sydney, are negotiable. Salary is $36,313 to $38,470 p.a. Contact Personnel Officer (Central Office), Department of Health, N.S.W., P.O. Box K110, Haymarket, Sydney, 2000, Australia.

LATENT PRINT EXAMINER
The City of San Diego has an opening for a latent print examiner with experience equal to one full year in the classification and searching of fingerprints and the examination of latent fingerprints. Salary $2070-$2501/mo. Contact Paul Heeter, 202 C Street, San Diego CA 92101.

FORENSIC ALCOHOL ANALYST
The City of San Diego has an immediate opening for a Forensic Alcohol Analyst. For further information, contact Gerald Chiles, Personnel Analyst, City Administration Building, 202 C Street, San Diego CA 92101.

DOCUMENTS EXAMINER
The State of Nebraska has an opening for a document examiner with a minimum of four years experience in the examination of documents. The salary is based on qualifications. For additional information, contact Michael Mitchell, Personnel Manager, Nebraska State Patrol, P.O. Box 94907, Lincoln NE 68509.

CRIME LAB SUPERVISOR
The State of Nebraska also has an opening for an individual to supervise the operation of the State Crime lab as well as do forensic analysis. See the previous announcement for additional information.

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SECTION and STUDY GROUP ACTIVITIES

The Study Group and Sectional Meetings are where the real work of the Association is accomplished: Exchange of information, help with problems, discussions of new techniques and current problems, reviews of new and existing methods, etc. All members are encouraged to participate in any study groups in which they have an interest, and to regularly attend regional section meetings. The individuals to contact regarding regional and study group activities are listed here along with recent and anticipated meetings. Study group moderators are encouraged to submit summaries of their group's activites for each newsletter.

NORTHERN SECTION

Bruce Moran Regional Director	San Mateo Pol. Dept. 2000 Delaware Street San Mateo CA 94403 (415)574-6818

Northern Section Biology Study Group

Gary Sims	Inst of Forensic Science 2945 Webster St Oakland CA 94609 (415)451-0767

Northern Section Firearms Study Group

Grady Goldman	Contra Costa Co Sheriff 1122 Escobar St Martinez CA 94553 (415) 372-2962
Richard Schorr	Contra Costa Co Sheriff 1122 Escobar St Martinez CA 94553 (415) 372-2455

Northern Section
Trace Evidence Study Group

Marty Blake	Oakland P.D. 455 7Th St- Rm 608 Oakland CA 94607 (415) 273-3386
Stephen Shaffer	Inst. of For. Sci. 2945 Webster St Oakland CA 94609 (415) 451-0767
Theresa Spear	Alameda Co Sheriff 15001 Foothill Blvd San Leandro CA 94578 (415) 577-1705

Northern Section Drug Study Group

Lance Gima	CA Dept of Justice Hall of Justice San Rafael CA 94903 (415)472-4425
Ken Fujii	Contra Costa SO 1122 Escobar St. Martinez CA 94553 (415)372-2455

SOUTHERN SECTION

Eston Schwecke	Huntington Beach Police Dept. 2000 Main Street Huntington Beach CA 92468 (714)536-5682

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STUDY GROUP ACTIVITIES (continued)

Southern Section Biology Study Group

Barbara Johnson — Los Angeles Co SO
2020 W Beverly Blvd
Los Angeles CA 90057
(213) 974-4611

Carol Rhodes — Cal Lab of
Forensic Sci
17842 Irvine Blvd
#224
Tustin CA 92680
(714) 669-9461

At the April 17th study group meeting, Dave Sugiyama, Carol Rhodes and Barbara Johnson were reenlisted to coordinate future serology study group meetings. It is the hosts responsibility to set the date, the time, the meeting place and the topic. A draft letter on meeting information should be forwarded to Barbara Johnson (LASO) at least one month prior to the meeting for distribution to members.

Dan Gregonis, Carol Rhodes, Ron Linhart, Faye Springer and Jim White of the Quality Assurance Committee handed out the first QA draft for our review and comments-- please review your laboratory's copy and forward your comments to Dan Gregonis before the next study group meeting. Our thanks to the committee for all their hard work.

At the last meeting DOJ Riverside requested our assistance in obtaining donors for semen-free vaginl swabs and semen swabs; the ABH levels from the study will hopefully be presented at the next spring CAC seminar. If you want to participate, please contact:

Linda Harstrom
Criminalistics Laboratory
1500 Castellano Road
P.O. Box 3679
Riverside, CA 92519
(714)781-4170

Also the possibility exists to do some field testing on monoclonal antibodies, for mor information contact:

Dr. John Herr
Department of Anatomy and Cell Biology
University of Virginia Medical School
Charlottesville, VA 22908
(804)924-2007

The speaker at the next meeting of the study group will be Ed Blake, Forensic Science Associates, who will present the papers he presented at the lax-st CAC Seminar. The titles of those papers are

Evidence the "Vaginal Peptidase is a Bacterial Gene product

Detection of Antisperm Antibodies: A Case Report (Video)

A Gram Modified Christmas Tree Stain

Desialidation of GC Variants

Southern Section
Trace Evidence Study Group

James Bailey — Los Angeles Co SO
2020 W Beverly Blvd
Los Angeles CA 90057
(213) 974-4611

Harley M. Sagara — Los Angeles Co SO
2020 W Bevrley Blvd
Los Angeles CA 90057
(213) 974-4611

Southern Section Drug Study Group

Carole Sidebotham — Orange Co. Sheriff-Coroner
P.O. Box 449
Santa Ana CA 92702
(714) 834-3073

HONORS and AWARDS

DISTINGUISHED MEMBER AWARD

James White of the Orange County Sheriff's Office Laboratory was the recipient of the CAC Distinguished Member Award for 1986. Jim was presented with a plaque at the Seminar banquet in Concord. Jim was recognized for the variety of his contributions which include not only ongoing work in serology, but also drug analysis, participation in the southern study grups and consistent presentation of papers in these areas at our seminar.

OUTSTANDING PRESENTATION

Lucien Haag was chosen to receive the first Outstanding Presentation Award for his paper given at the Spring Seminar in Concord. The final selection was very close, however his presentation on "The Measurement of Bullet Deflection and Behavior After Striking Intervening Objects" received very high marks on originality. Overall his paper was an excellent example of preparation and oral presentation. Luke will receive a $100.00 stipend which will be presented at the Fall Seminar in Palm Springs.

RACQUETBALL TOURNAMENT

Racquetball Winners at the CAC Spring '86 Seminar in Concord were:

B Level: Grady Goldman, Contra Costa Sheriff's Office

C Level: Don Jones, San Bernardino Sheriff's Office

Novice: Kathi Holmes, Contra Costa Sheriff's Office

1st Place Team: Bruce Fukayama, Kathi Holmes (Contra Costa County); Don Jones, David Stockwell (San Bernardino County) and Alan Keel (Oakland Police Department)

Fifteen people participated in the racquetball tournament and had a great time.

PAUL KIRK AWARD

Nominations for the Paul Kirk Award will begin on August 1, 1986. To be eligible for this award, the nominee must (1)be a CAC Member who has been in the profession less than 5 years, and (2)have a paper describing original research, a technical note or an unusual case to be presented at the American Academy meeting in San Diego. The American Academy provides a $100.00 stipend to the recipient. (See the attached anouncement and nomination form for further details.)

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EDUCATION IN FORENSIC SCIENCE

(reprinted from the MAFS Newsletter)

The recent MAFS Meeting in Indianapolis featured a 2-1/4 hour symposium on Forensic Science Education. The theme of the symposium was "What Direction: Forensic Science Education?" and featured panelists who are on the leading edge of forensic science education in the midwest. They discussed and debated educational qualifications, training, and compentency expectations of present and future crime laboratory personnel.

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EDUCATION IN FORENSIC SCIENCE **(continued)**

Graduate Programs in Forensic Science: Current Status and Future Directions
Joseph L. Peterson, Director, Center for Research and Justice, University of Illinois at Chicago, Chicago, IL 60680

There are presently ten viable graduate programs in criminalistics/forensic science at colleges and universities around the country. In contrast to the 1966-75 decade when five new programs were formed, no new programs have been established in the past decade. There has been considerable activity in these programs, however, as some have been modified and expanded, while others have been discontinued. This paper will discuss the strengths and weaknesses of such programs, their relevance to the operating field of criminalistics, and likely future directions.

The M.S. in F.S. - Rationale For the Masters or Advanced Degree in Forensic Science
Michael J. Camp, Head Chem/Physics Section, Wisconsin Regional Crime Laboratory-Milwaukee, (Former Coordinator of Forensic Science, Northeastern University), Milwaukee, WI 53204

There is a certain amount of controversy centered around the role of graduate degrees in forensic chemistry and forensic science. Much of this has to do with the difference between education and training. Several philosophies which have been used in MSFS, MSFC and PhD programs will be presented.

To B.S. or Not to B.S.
The Case for a Masters Degree in Forensic Science
Jay A. Siegel, Associate Professor, School of Criminal Justice, Michigan State University, East Lansing, MI 48824

Based upon eight years of teaching courses in and administering a B.S. degree program in the oldest forensic science program in the U.S., it is the author's contenton that the typical B.S. degree program in criminalistics will no longer meet the needs of the forensic science community, especially the crime laboratories. A well designed M.S. program in forensic science offers not only the depth of a B.S. program but additional breadth and the resources to carry out much needed research in the field of forensic science. A blueprint for a five-year program leading to the M.S. in forensic science will be presented.

The B.S. in the F.S.
Ready Made for the Crime Laboratory
Robert E. Fraas, Director, Forensic Science Program, Eastern Kentucky University, Richmond, KY 40475

A decade ago there was a cry for personnel qualified for forensic science laboratories with a minimum of on-the-job training. A number of universities responded by offering a B.S. degree program in forensic science. Most of these programs combined existing science courses with newly developed courses in forensic science to form the basic curriculum for such a degree. The strengths and weaknesses of a B.S. degree in forensic science will be discussed.

Forensic Science
An Unnecessary Specialization
Robert C. Briner, Director, SEMO Regional Crime Laboratory, Cape Girardeau, MO 63701

As both a consumer and provider of scientifically trained students, it has become an increasingly difficult problem to know what to expect from B.S.-trained personnel. As a chemist, one can expect, and usually predict with some accuracy what a person of such background will be able to do. This is not necessarily true when one looks at the B.S. or, for that matter, a higher deg-

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EDUCATION IN FORENSIC SCIENCE (continued)

ree in forensic science. When specialization at the undergraduate level is at the expense of the so-called "core" courses e.g. organic, analytical, physical and biological chemistry, this specialization is counterproductive.

What Direction? Forensic Science Education, Education and Training Philosophy

Don M. Plagutz, Director, Training and Applications Laboratory, Bureau of Scientific Services, Department of Law Enforcement, Joliet, IL 60432

Even with all the general undergraduate and graduate academic training available in the classroom there is no substitute for extensive and intensive individualized training programs. Such training can best be accomplished through dedicated trainers teaching in a training laboratory associated with full-service operational (caseload) laboratory. The Bureau of Scienfific Services currently maintains programs in the major areas of forensic analyses. Such programs last from one to three years depending on the previous training and the individual abilities of each student. In addition to the training of our own personnel, the BSS administers an Intern Training Program based on their needs and interest. Details concerning these and other program goals will be presented.

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THE CABOOSE THEORY

Report of the CAC Board of Review

March 25, 1986

To: CAC- Board of Diretors

From: Review Panel - Forensic Serology Theory in Bower Case

Subject: Final Report

In January, 1985, the CAC Board of Directors was requested by a CAC member to appoint a Board of Review to determine whether or not testimony given and laboratory analyses conducted by the various criminalists participating in casework in a criminal trial in Solano County - People vs. Mark Bower - was within what would be considered competent professional practice.

The Board of Directors subsequently appointed an ad hoc commettee consisting of John Murdock, Chairman, George Sensabaugh and Jim White to evaluate testimony regarding forensic serology theory. The Board of Directors did not feel it was appropriate to address questions relating to the laboratory analyses on this case since: a) This issue had already been subjected to review by the parent agency and b) several of the criminalists involved were not then and are not now members of the CAC.

Testimony identified as questionable was given by a criminalist to explain discrepancies in the ABO typing by several of the analysts. This theory, which has come to be known as the "Caboose" theory, speculates that the terminal sugars of the ABO(H) antigenic determinants can be lost during the aging of a bloodstain resulting in the apparent conversion of A or B blood types to an O blood type. No indication of these changes could be found in the literature of bloodstain analysis or in

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THE CABOOSE THEORY (continued)

the casework experience of analysts interviewed. Therefore it was decided to approach the source of this testimony for the basis for this opinion.

The following series of four letters (see enclosures with this Newsletter, ed.) represents the exchanges between DOJ-BFS Chief Steve Hensley and the CAC review committee. As you can see, the Caboose theory is presently unsupported in casework, is not supported by the DOJ Bureau of Forensic Services and, unless it can be documented in casework, will not be used in court by their staff.

Why it was offered by the Criminalist in Bower and later reaffirmed in Ardon remains a mystery. Perhaps it is one of those unfortunate ad hoc explanations offered when nothing else seemed satisfactory. If this is the case, it underscores the importance of offering as expert opinion testimony only that which is scientifically defensible. Speculation has no place in testimony and should not be disguised as scientific theory.

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Analytical Data Concerning Olivetol 5-n-Amylresorcinol

Kevin Guarino, M.P.H.
Bureau of Alcohol, Tobacco,
and Firearms
Bldg. 233, Treasure Island, CA 94130

and

John Thornton D.Crim.
Forensic Science Group
Dept. of Biomed. and Environmental
Health Science
University of California
Berkeley, CA 94720

All of the common syntheses of synthetic tetrahydrocannabinol and other cannabinoids [1-4] have in common the use of olivetol (5-n-amylresorcinol, or 1,3-dihydroxy-5-pentylbenzene) to provide the aromatic moiety. Little analytical data concerning olivetol has appeared in the forensic literature. The present work attempts to provide the analytical data necessary to identify olivetol in cases of suspected illicit production of THC.

Olivetol does not appear to occur free in nature, although trace amounts of a corresponding carboxylic acid have been isolated from lichens [5]. Olivetol was first synthesized by Asahira and Asano in 1932 [6] by the condensation of ethyl-n-caproyl-acetate with ethyl acetonedicarboxylate followed by fusion of the reaction mixture with solid sodium hydroxide. Another synthesis was reported in 1935 by the same laboratory [7] which involves the reduction of dimethoxyphenyl n-butyl ketone by a modified Wolff-Kishner method followed by a demethylation. The synthesis of Suter and Weston [8] involves the hydolysis of 3,5-dibromo-n-amylbenzene which in turn is obtained from the corresponding dimethoxyamylbenzene.

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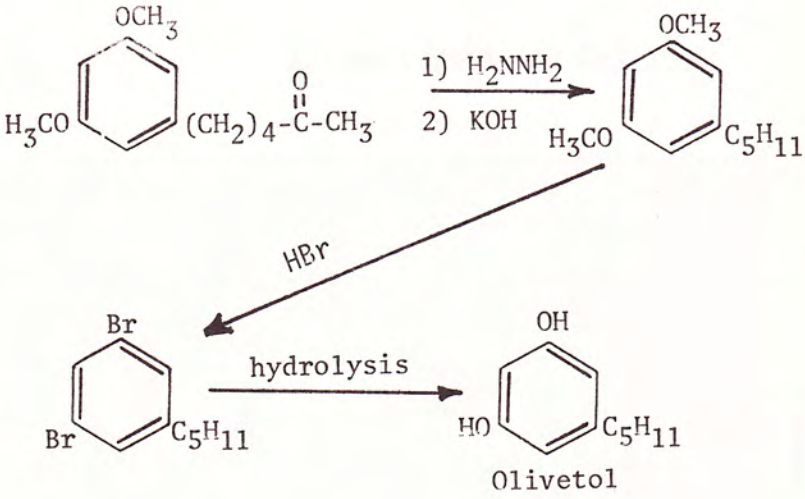
5-n-Amylresorcinol (continued)

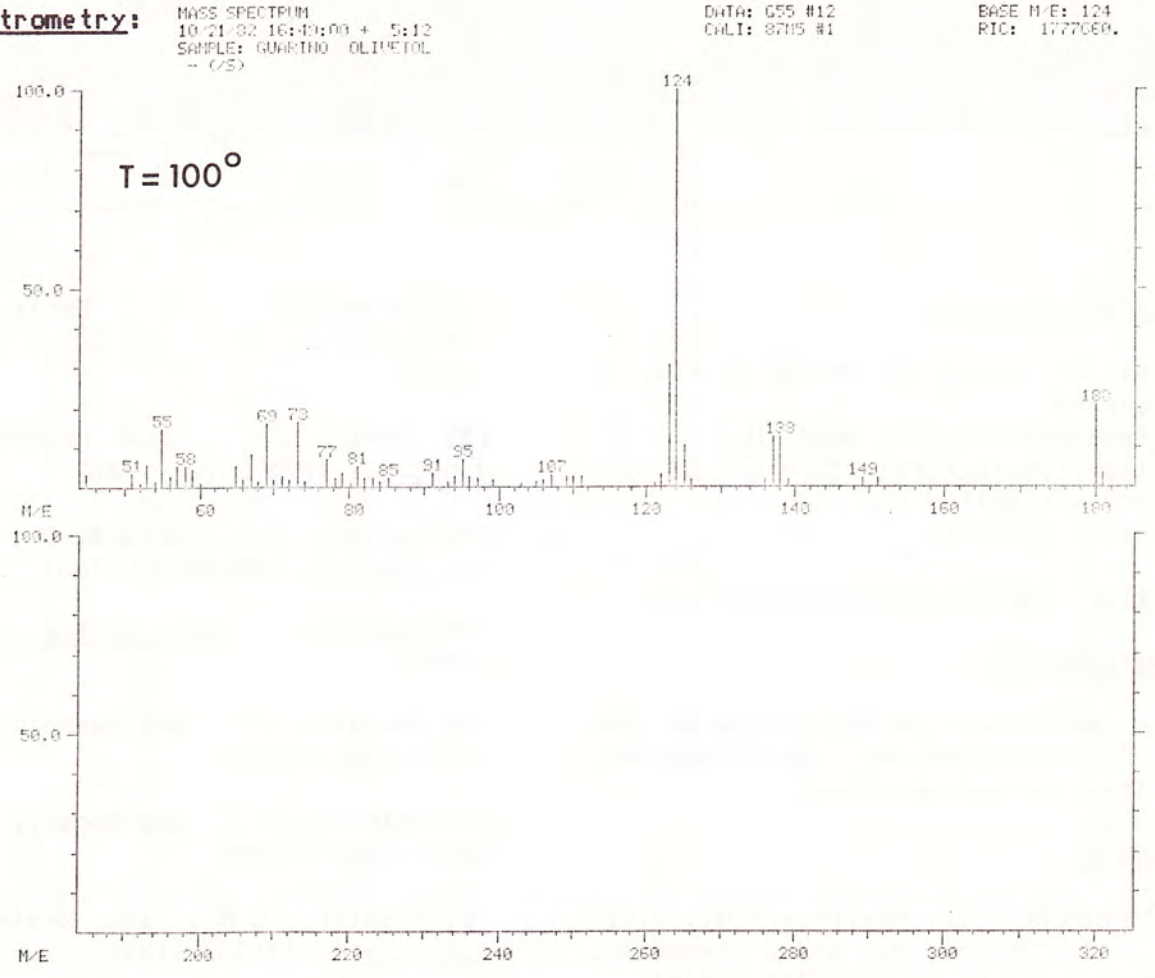
Presented here are analytical data derived from UV and IR spectrophotometry, gas chromatography, and mass spectrometry.



<u>UV Spectrophotometry</u>

	Maxima (nm)	Minima (nm)
pH 2 (0.1 N HCl)	271 and 278	242
pH 10 (0.05 M Borate buffer)	283	255
Ethanol	275	244

<u>Mass Spectrometry</u>:



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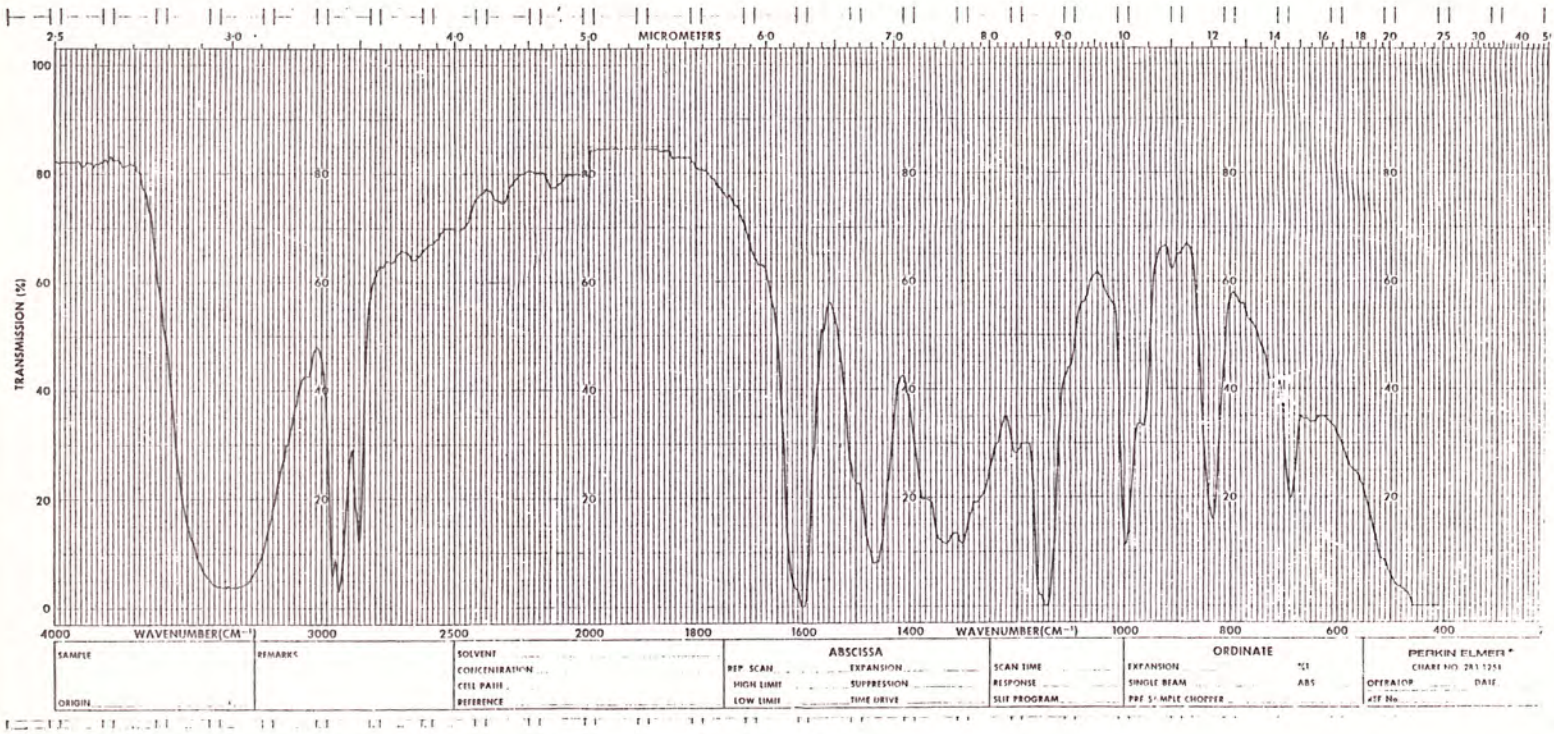
5-n-Amylresorcinol (continued)

Infrared Spectrophotometry



(KBr)

Gas Chromatrography

Column: 3′ x 1/4" 3% SP2100 on 100/120 Supelcoport
Oven temperature: 150 degr. C.
Injection temperature: 250 degr. C.
Carrier gas: Helium
Flow rate: 30ml/min

Retention time of olivetol: 10.3 min.

Acknowledgement

The assistance of David Chia of the U.S. Customs Laboratory, San Francisco, is gratefully acknowledged.

References

[1] Petrzilk, T., Haefliger, W., Sikemeier, C., Ohloff, G., and Eschenmoser, A., Helv. Chim Acta, (50):719 (1967)

[2] Fahrenholtz, K.E., Lurie, M., and Kierstead, R.W., J.A.C.S., (89):5934 (1967).

[3] Gaoni, Y., and Mechoulam, R., J.A.C.S., (87):3272 (1965)

[4] Taylor, E.C., Lenard, D., and Shvo, Y., J.A.C.S. (88):367 (1966)

[5] Asahina, Y., Acta Phytochim., (8):83 (1934)

[6] Asahina, Y. and Asano, J. Ber. (65B):1500 (1932)

[7] Asahina, Y., and Nogami, H. Ber. (68B):1500 (1935)

[8] Suter, C.M., and Weston, A.W., J.A.C.S., (61):232 (1939)

High Velocity Backspatter on Shirt Sleeves

James O. Pex, M.S.
N. Michael Hurley, B.S.
Charles Baughan, B.S.

Oregon State Police Crime Laboratory
3620 Gateway
Springfield, Oregon 97477
(503) 726-2590

(reprinted by permission from the Newsletter of the Northwest Association of Forensic Sciences)

INTRODUCTION

The Interpretation of bloodspatter by the OSP Crime Laboratory Division has been a useful technique in crime scene investigations for many years. Most commonly it is observed on floors, walls and ceilings at crime scenes and can be prima facie evidence in the reconstruction of the events. Proper interpretation of crime scene evidence can link the perpetrator to the scene.

High velocity bloodspatter from a gun shot wound is the result of energy transfer from the projectile and gases to the surrounding blood and tissue. This subsequent gas expansion and contraction creates a "backspattered" aerosol or blowback toward the weapon and hand. These small blood droplets are characteristically less than 1/8 inch in diameter. Their quantity will be dependant upon the muzzle to target geometry and the impact surface. An exposed skin area, such as the forehead or the hand, will create considerably more backspatter than a clothed or hair-covered area.

Casework observations and experimental work have shown that high velocity backspatter is not arbitrary but rather predictable and reproducible.

Much of the experimentation described is the result of a recent case investigation in which it was necessary to establish in the absence of a firearm, that a subject potentially could be linked to a shooting based soley on the subject's clothing and information derived from the victim (.22 caliber bullet and muzzle-to-target distance).

Experiments were conducted to consider this evidence in light of transferred blood, possibly from light contact with another bloody item. The amount of spatter, size of the droplets, its location on the weave and its general position on the sleeve were considered.

EXPERIMENTAL

Simulated gunshot wounds were produced with a Ruger Mark IV .22 caliber semi-automatic pistol and a Ruger Bearcat .22 caliber revolver. A bloodsoaked sponge was placed inside a plastic bag, sealed and pinned to the front of a pea-gravel bullet trap. Test fires were performed in both contact,near contact and muzzle-to-target distances as far back as one foot. Similar tests were performed after the sponge bag was covered with varying layers of cloth.

The shooter wore long-sleeve shirts of cotton and wool blend. White lab coats provided excellent contrast for photographic purposes.

For transfer patterns, various bloody

(continued on page 13)

High Velocity Backspatter on Shirt Sleeves (continued)

objects, such as clothing, wood pencils and knives were lightly touched to clean linen.

OBSERVATIONS

1. For .22 caliber weapons, backspatter is observed only when muzzle-to-target distances are contact to near contact.

2. A bloody sponge inside a sealed plastic bag would produce greater backspatter than a cloth covered bag. This duplicates observations made during actual gunshot crime scene investigations.

3. The type of target covering, if any, (clothing, plastic, etc.) greatly affects the amount of backspatter produced and observed. The thicker the outer layer covering, the closer the barrel must be to create the spatter.

4. The backspatter blood has not been observed beyond a distance of two feet when produced by a .22 caliber handgun.

5. Surfaces within two feet of the target and perpendicular to the blood-flight path may exhibit a high velocity bloodspatter pattern. This surface may be the weapon, inside the bore, the leading surface of the hand and adjacent clothing.

6. Small blood droplets dry rapidly after deposition on the hand and become rigid. The elastic nature of the skin during movement loosens the droplets and they are lost within a short time. Any addition of water will quickly dissolve them and render the pattern uninterpretable.

7. The location of the backspatter will be affected by the angle of the muzzle to the target. An upward shot resulted in more observed spatter on the top of the sleeve. Conversely, a downward shot produced more spatter on the lower sleeve.

8. On colored garments, the high velocity blood droplets may not be readily visible and thus require a careful microscopic examination to be observed.

9. Gunshot high velocity bloodspatter will strike a cloth object randomly with regard to weave or design. It may be visible on the inside, outside or leading edge of long-sleeved shirt cuff.

10. Blood lightly transferred from an object to cloth will be observed microscopically on the top surfaces of the weave, rather than in the valley of the weave.

DISCUSSION

High velocity backspatter from a .22 caliber pistol or revolver can produce a pattern on a shirt cuff of a shooter in a contact or near contact shot. When present, this spatter can be differentiated from transferred blood through careful microscopic examination in the circumstances previously observed. Although it may be found as far up the sleeve as the shoulder, it is usually limited to the cuff or lower sleeve area (specifically the area near the shirt button). If the muzzle is pointed upward the spatter may be viewed higher up the sleeve. A downward pointed muzzle may shift the pattern toward the underside of the cuff. The observed pattern must not be discounted based on a limited number of droplets. The droplets may still be interpreted with a careful microscopic examination. The quantity of blood is usually insufficient for typing purposes and the relationship to the victim can only be inferred by the specific circumstances in which this pattern may have occurred.

It is recommended that the examiner attempt to duplicate the observed pat-

(continued on page 15)

High Velocity Backspatter on Shirt Sleeves (continued)

tern utilizing a garment of identical fabric and the same weapon and ammunition if available.

References:

1. MacDonell, H.L. Bloodstain Pattern Interpretation, Handbood published by MacDonell, 1982

2. Stephen, B.G. and Allen, T.B. "Backspatter of Blood From Gunshot Wounds - Observations and Experimental Simulation." J. For. Sci., 28(2), April 1983, pp 437-439.

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Substitution of p-hydroxybenzaldehyde for Vanillin in the Duquenois Reagent

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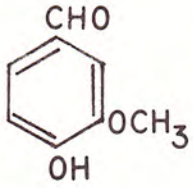
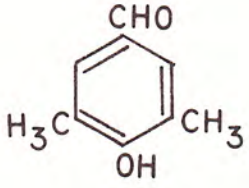
Duquenois reagent made up with p-hydroxybenzaldehyde (I) in lieu of vanillin (II) gives colors with cannabinoids of the same intensity as the reagent made up with vanillin. The same statement can be made of 3,5-dimethyl-4-hydroxybenzaldehyde (III). Since it does not appear to make a difference in the intensity of the reaction whether the reactive species in the reagent has no substitution at the meta position (as in p-hydroxybenzaldehyde) or has both meta- sites masked (as in 3,5-dimethyl-4-hydroxybenzaldehyde), it is concluded that the substitution at the meta- position has little determinative effect upon the overall Duquenois reaction.

Two interesting differences are noted, however, when using p-hydroxybenzaldehyde in lieu of vanillin. The colors observed in the acidic aqueous

(I)



(II)



(III)

(continued on page 16)

Substitution of p-hydroxybenzaldehyde for Vanillin in the Duquenois Reagent
(continued)

solution and the terminal chloroform extract are inverted with respect to the classical Duquenois reagent. Whereas with the Duquenois reagent the acidic aqueous layer is blue and the chloroform layer is violet, with the p-hydroxybenzaldehyde reagent the acidic aqueous layer is violet and the chloroform layer is blue.

All of this so far is perhaps a distinction without a difference. However, if the reagent is made up with p-hydroxybenaldehyde, the colors formed with cannabinoids are persistent. Whereas the colors formed with the vanillin Duquenois are transient and fade after a few hours at the most, the colors formed with the p-hydroxybenzaldehyde reagent persist for days.

This may be applicable to situations involving thin layer chromatography. As a visualizing spray, the Duquenois reagent is less sensitive than diazo salts, such as Fast Blue 2B, by a factor of ten. But on the other hand, Fast Blue 2B reacts with many compounds other that the phenolic consistuents of Cannabis, and holds no claim for specificity. Also, when spraying the TLC plate first with Fast Blue 2B, and then using Duquenois reagent as an overspray, the sensitivity will be doubled as compared to Fast Blue 2B alone. In these situations, where the persistence of a formed color may be of concern, the use of p-hydroxybenzaldehyde may override the historical and economic reasons for using vanillin.

California Association of Criminalists

OFFICE OF

CAC Review Panel on Forensic Serology Theory in the Bower Case

October 22, 1985

Steve C. Helsley, Chief
Bureau of Forensic Services
California Department of Justice
Post Office Box 13337
Sacramento, CA. 95813

Dear Chief Helsley:

As you know, on January 11, 1985 the CAC Board of Directors was requested to conduct a Board of Review into testimony given by Criminalists regarding Forensic Serology examinations in the Bower Case. For a number of months thereafter, I attempted to persuade Bob Drake, the Chief of BFS, to release the results of a peer review group that he caused to be formed for purposes of reviewing the testimony given by two DOJ criminalists. One of them, put forth a theory which has come to be known as the "caboose" theory. Bob Drake eventually refused to release this material; you subsequently affirmed his stance in a letter to me dated March 28, 1985. In the same letter, however, you agreed that the findings of the Peer Review group could have "...broad and potentially positive application to the Forensic Science profession." You also implied release of a review of current practice. You subsequently sent me a draft dated 7-1-85 of your Technical Guidelines 85-1 - Serology - which in quite good fashion addresses, in a general way, the technical aspects of testimony about serology presented in Bower.

The Caboose theory offered by Criminalist is not, however, specifically addressed by Guideline 85-1. This theory was given in Bower as one possible explanation for a discrepancy in ABO blood typing results. It has since been mentioned by in Peo. v. Luis Ardon at pages 694 and 696.

On August 16, 1985, the CAC Board of Directors established a Review Panel to review and determine the validity of any Forensic Serology Theory presented in the Bower Case. I am the Chairman. The other two members are George Sensabaugh and Jim White.

Our Committee has reviewed the transcripts and find the only testimony about serology theory to be that of when he put forth the Caboose explanation for differing ABO grouping results. This testimony appears on pages 1354 and 1355. If the conversions described by really do occur, they undermine the reliability of the ABO grouping system in dried blood; a system which is highly regarded as being quite stable. It is this potential for profound impact on such a basic tenet that, in the opinion of the Board, justifies such a direct inquiry into a non CAC members testimony.

Continued

As I mentioned above, the review panel constituted by the DOJ reviewed notes, transcripts and case reports. Their findings were summarized in only the most general way in a letter dated December 21, 1984 to Dr. Edward Blake from Bob Drake. The finding regarding the Caboose theory was stated as follows:

> "The committee was unable to accept the theory offered in testimony by one of our Criminalists. They believe the theory offered to explain the grouping differences was, and is, unsupported by any known or documented forensic studies."

Instead of simply relying on this finding, our committee would like to have a dialogue with about his Caboose theory. When I spoke with you about this on August 26, 1985 you said that you were strongly in favor of our questioning about his testimony. We have, therefore, formulated the following series of questions for him. As I mentioned to you on August 26, 1985, it is our desire to publish the findings of our Committee in the CAC newsletter. This publication may, of necessity, include some of answers to these questions.

- Questions for Criminalist Concerning Testimony about the Caboose Theory Offered in Bower -

1. By what mechanism can the terminal sugars of the A & B Blood Group Determinators be removed?

2. Under what environmental storage conditions do these mechanisms occur?

3. Did any of these conditions apply to the Bower evidence?

4. Do you still believe this to be a valid theory to account for the different results in ABH obtained in Bower?

5. a. Is there a difference between the ABH determinants in blood and in semen with regard to:
   1. Mechanisms of decay
   2. Rates of decay
   3. Conditions promoting decay

   b. If so, document -

6. a. Is there precedent for A to H or B to H conversions in evidence materials?

   b. If so, document -

7. If such conversions do occur, can you justify doing ABO (H) typing on evidence?

8. What scientific basis existed for the Caboose theory at the time that testimony about it was given?

Continued

9. If a discrepancy between experts occurs, is there an obligation to provide an explanation in Court?

10. If there is an obligation to explain discrepancies, should't all possibilities be presented?

11. If there are multiple possibilities, does the expert have an obligation to provide some evaluation of each one?

12. Do you believe an expert in Court should only answer questions asked or does the expert have an obligation to clarify by elaborating on simple answers?

13. If an expert makes a mistake in analysis or in testimony, should the expert acknowledge the mistake in testimony in subsequent cases?

Questions 1 through 8 are directed at the scientific basis, if indeed there is any, in the Caboose theory. Questions 9 through 13 are directed at some considerations having to do with presenting the results of casework in Court. As I'm sure you know from many years of service in law enforcement, the presentation of the results of casework or investigative effort in Court is just as important as the work itself.

The CAC Board of Directors wants to bring this matter to a close as soon as possible. prompt reply to these questions will help us do this. In the event that his replies prompt other questions I sincerely hope that you will be as receptive to our asking them in writing as you have been with those listed above.

Very truly yours,

John E. Murdock, Chairman

JEM:ph

attachments:
- pages 1354 and 1355 of testimony from Bower
- pages 693 - 697 of testimony in Ardon

cc: Steve Cooper, President
Stephen Shaffer, Secretary
Jim White, Committee Member
George Sensabaugh, Committee Member

for the Department of Justice and investigating agencies to freeze the entire lining rather than simply a part of it, for further testing later?

A Theoretically it's preferable, but it's highly responsible or -- excuse me, that isn't the correct word.

We just can't freeze every single item or drop of blood because there's just too many, so we freeze portions that normally we analyze so that if there's a question on our analysis then that portion is available. And we try to take a representative sampling.

Q Are you familiar with how much actual space that lining, 1-B, takes up?

A No.

Q Didn't you look at it?

A I saw the large portion which was delivered to me and the small portion.

Q Now, the large portion of that that was delivered to you fits into an envelope that's about five inches by eight inches, doesn't it?

A Yes.

Q But that was -- and assuming that had not been refrigerated, isn't the Department of Justice capable of freezing an object that's about an eighth of an inch wide and five by eight inches in size?

A It's capable, of course.

Q You have refrigerators, right?

A Yes.

Q Would it surprise you to learn that when Mr. Saggs

tested this, apparently the same area that was frozen, that he got no O activity? Would that surprise you in any way?

A Again, it would be interesting but not totally surprising due to the fact that he tested it a great deal of time ago.

Q Uh-huh (affirmative).

A He didn't test it at the same time I did.

Q So, what? O activity started growing on this jacket? Is that what you're saying?

A No. That during the breakdown process -- freezing preserves the samples, but it doesn't stop the breakdown. Possibly some of the A and B activity's breaking down to H because of the fact that in ABO blood types the antigen is basically the backbone and A and B are just sugars attached on the ends. It's like a long freight car, either you have a red caboose at the end or a green caboose and possibly some of the cabooses are just falling off or left with the trains.

Q So these are just falling off, is that how you explain that?

A That's one explanation.

Q ABO testing can be done over a period of time?

A Yes.

Q As opposed to enzyme testing?

A Yes.

MR. HONEYCHURCH: Just a moment.

A No, I am not aware of that.
Q Now, let me ask you: You stated in your testimony that H exists, the H type, ABH type, the H is in both A, ABO and -- I mean -- strike that.
A type blood existing in O type blood exists in B type blood and also in AB type blood, is that correct?
A Secretors, yes.
Q All right. Now, do you -- am I correct in stating that the A and the B that you have in the secretions are just a type protein or marker that is attached to an H type protein, not to an H type secretion?
A The determining factor of whether or not you are going to have A or B activity is to determine by the backbone or the H activity with a terminal sugar.
Q Now, you state that there is an A terminal or B terminal sugar that is attached to an H.
Now, with time is it possible for an H with a B terminal sugar attached to lose that B sugar activity?
A We are talking about blood or semen?
Q Semen.
A We haven't done any studies, so I can't answer the question.
Q Do you recall testifying in Solano County in the case of People versus Bower this year in which you stated on the record that that's the case?
A That wasn't a semen case.
Q What was it; was it blood?
A Yes.

Q All right.
A Which was a year and a half old.
Q A year and a half old?
A Which I had no control over the conditions of the sample.
Q Now, you are saying that there are secretions in the blood, the ABH secretions in the blood?
A No. You said that.
Q Well, I am asking you about the secretions in the semen, and you said there you were talking about the blood, and I am trying to understand what you are referring to.
A I believe you said there are AB found in -- A and B secretions found in blood H activity.

I thought you were referring to water secretions in which an A and B, a B individual will produce those types of activity, plus H activity.

Q All right. Now, what I am saying is what you stated, if I interpreted you right, that it's basically an H activity which also exhibits the A or the B activity that are attached, the sugar's attached to that H itself; is that what you are stating?
A Yes.
Q Okay. Now, what I am saying is that is it possible with lapse of time that either the B sugar activity that's attached to the H, or the A sugar activity that's attached to the H, could lose that A activity or the B activity?
A Probably under some adverse conditions it might be possible.

Q Now, is it possible that activity that you stated that has that H and the B, that that was possibly a HAB activity and that the A merely got lost?

A I have no indication of that.

Q Okay. Did you have any indication of it in any cases that it gets lost?

THE COURT: Cases involving what, analysis of blood or analysis of semen?

MR. SUKHRAM: Analysis of ABH analysis.

THE COURT: No. Analysis of blood or analysis of semen?

MR. SUKHRAM: I think -- it's semen, your Honor, but I think he said there is none in blood.

THE COURT: The question is, has he encountered any semen analysis cases where the factor which should have been present was no longer present?

THE WITNESS: No.

MR. SUKHRAM: Q Okay. How did you come up with that conclusion that it does happen?

MR. BEATTIE: That's a misstatement of his testimony.

THE COURT: I agree. He said it's possible.

MR. BEATTIE: Under adverse conditions.

THE COURT: Under adverse conditions.

MR. SUKHRAM: Q How do you come up with the conclusion that it is possible under adverse conditions for that to happen?

A Again, we are talking about a blood stain, and here we are talking about a semen stain.

We are talking about two different items.

Q Now, are you stating that activity can just disappear in a blood, but not in a semen?

A We haven't noticed that.

Q Okay. You notice it in the blood because it came up in a case, is that correct?

A No. I didn't notice it.

Q Someone else in your lab noticed it?

A No.

Q Then how did you come up with the conclusion that it happened in that blood case?

A I said it was one possible explanation why the other individuals could not find the same thing we found.

Q I see. Okay. So there is a possible explanation in this case that the A activity could have through some, some process been lost from that H activity?

A I wouldn't expect it because of the fact that we are looking at apples and oranges again, because we are looking at semen samples versus blood samples.

We are looking at samples here which I know were stored in the freezer, which were delivered to me recently after their collection which I analyzed in a short time after they were delivered to the laboratory using different techniques than we used in the blood sample.

In that particular blood case I was ordered to analyze the sample that was over a year old, which I had no idea of the particular methods in which it was stored, and was asked why they weren't able to reproduce our results.

Q And your explanation was that that A activity or the B activity had actually dropped off the H activity?

A As I explained, that is one possible explanation. There's no way to say exactly what happened.

Q And is it possible that that happened in this case, also?

A There's nothing to expect that it did because of the fact in that particular case we had A loss they could not produce, or B activity.

Q Okay. But an A -- I am not going to argue about that particular case.

Now, going back to your analysis, the results that you got here, assuming the fact that the population, the frequency of B blood in the population, people who are racially Black is 21 percent, and doesn't that mean, okay, that one out of every five persons, Black persons, has type B blood?

A Yes.

Q All right. And assuming, further, that the percentage of frequency, percentage of Chicano or American-Indian persons, okay, the frequency of people with B type blood is 10.8 percent --

MR. BEATTIE: Your Honor, I am going to object to this hypothetical. It is based on no facts presented. It is not based on any evidence.

THE COURT: A hypothetical question does not need to be presented on evidence that has been presented, only evidence that is reasonably expected to be.

JOHN K. VAN DE KAMP
Attorney General

State of California
DEPARTMENT OF JUSTICE

P. O. BOX 13337
SACRAMENTO 95813

November 25, 1985

John E. Murdock, Chairman
CAC Review Panel
Contra Costa County Criminalistics Laboratory
P. O. Box 391
Martinez, CA 94553-0039

Dear John:

I have reviewed your letter of October 22, 1985, and, in order to answer the questions, have sought the advice of our Serology Technical Advisory Group. As you will recall when we first discussed this issue, I agreed to draft technical guidelines concerning our serology program so that the type of conflict which emanated from the Bower case could be avoided in the future. Per our agreement, the Serology Guideline 85-1 was developed and distributed at the California Association of Criminalists (CAC) meeting in late October.

The primary concerns of CAC seems to be first, does the Bureau of Forensic Services support the "caboose" theory; and, second, will any of our staff continue to present it as a valid theory. I have been advised that there are literature citations which support the theory that terminal sugars of the "A" and "B" blood group substances can be removed with the apparent increase in the "H" substance. While the situation could exist in certain theoretical circumstances, as a practical matter, we have no reason to believe that this has occurred in a casework setting. Given this, the Bureau of Forensic Services does not support the "caboose" theory. Unless this theory can be documented in casework, our staff will not present it in a courtroom setting in the future.

You also posed questions concerning the legal or ethical requirements surrounding the criminalist's testimony in court. It is our position that the responsibility lies with the prosecuting and defense attorneys to ask questions which produce for the jury or the court a clear understanding of the issues and the limits of the theory presented. While testifying, a criminalist must tell the truth and must clearly explain discrepancies or possibilities if asked specifically or if asked to give a narrative response. As all of us are aware who have spent time in the witness chair, one is frequently limited to "yes" and "no" answers. Frequently one is left with a frustration that the material was not presented in an altogether satisfying or accurate fashion. If the criminalist feels concerned about the manner in which he testified, he should so advise the attorney who requested his testimony. Clearly, though, attorneys do not control how a criminalist conducts his analysis, and the criminalist does not conntrol how

the attorney presents the case. If a situation arises where the criminalist is convinced that an injustice has been done and, after unsuccessfully seeking a resolution with the attorney, then the issue should be pursued between their respective supervisors. When it is clear that a criminalist has clearly made a mistake in the conduct of his professional work and is questioned under oath concerning that, he must respond truthfully.

I hope that this information is sufficient to address your concerns. The Bureau of Forensic Services will be happy to work with the CAC concerning these issues in the future and I am pleased that the issue of professional competence and ethics is of such a major concern. I am sure that the CAC will pursue vigorously all apparent ethical dilemmas in the future as strongly as it has some of the casework issues in the Bower matter.

Very truly yours,

JOHN K. VAN DE KAMP
Attorney General

S. C. HELSLEY, Chief
Bureau of Forensic Services

SCH:erc

cc: Steve Cooper

California Association of Criminalists

Office of
CAC Review Panel on Forensic Serology
Theory in the Bower Case

January 8, 1986

S.C. Helsley, Chief
Bureau of Forensic Services
California Dept. of Justice
Post Office Box 13337
Sacramento, CA. 95813

Dear Steve:

Thank you for your letter of November 25, 1985. I have reviewed it carefully and am quite satisfied with most of it. As you know, I would like to publish, in the CAC newsletter, my letter to you dated October 22, 1985 together with your reply. I feel that the two letters adequately address the "caboose" theory issue in Bower. I am troubled, however, with the line of reasoning expressed in the third, fourth and fifth sentences in paragraph three. I am afraid that, if they are published without explanation or further clarification, undo criticism will be generated toward your Bureau. It is, therefore, in the spirit of cooperation and Forensic harmony that I ask for clarification. Your comments in paragraph three paint a very restrictive picture within which the Criminalist responds narrowly to questions the net result of which is a frequent feeling of frustration.

While it is true that a Criminalist doesn't control how an attorney presents his/her case I submit that Criminalists can control to a very great extent, how they present testimony. Contrary to your statement that".. frequently one is left with a frustration that the material was not presented in an altogether satisfying or accurate fashion" it has been my experience that a Criminalist can control his/her testimony such that the frustration you describe is seldom experienced. One has only to request to be heard for fear of being misunderstood or misinterpreted. With this request on the record, permission is seldom withheld. Indeed, the passion to present testimony in a fashion that ensures that the recipient properly understands the significance (including "... discrepancies or possibilities") has compelled CAC to include Ethical Aspects of Court Presentation as section III of its Ethics Code. In the

Continued

event that you wish to redefine your characterization of the Criminalists courtroom demeanor I will be happy to include this along with your original reply of November 25, 1985.

Inquiries such as these are difficult and often charged with emotion. This case was no exception. However, our profession has a responsibility to deal with and equitably resolve cases like this. Without mutual cooperation equitable resolution is often not possible. Thanks again for cooperating with the CAC toward the resolution of this matter.

Sincerely,

John E. Murdock, Chairman
CAC Review Panel

JEM:ph

cc: Steve Cooper, President
Steve Shaffer, Secretary
Jim White, Committee Member(Nov. 25, 1985 BFS letter to Murdock attached)
George Sensabaugh, Committee Member (Nov. 25, 1985 BFS letter to Murdock attached)

JOHN K. VAN DE KAMP
Attorney General

State of California
DEPARTMENT OF JUSTICE

P. O. BOX 13337
SACRAMENTO 95813

February 19, 1986

Mr. John E. Murdock, Chairman
California Association of Criminalists Review Panel
Contra Costa County Sheriff-Coroner's Department
Criminalistics Laboratory
1122 Escobar Street
Martinez, CA 94553

Dear John:

To my letter of November 25, 2985, regarding the Bower matter, you responded on January 8, 1986, and expressed concern about some of my observations. I offer the following clarification.

We seem to differ on how frequently the criminalist leaves the witness stand with "frustration that the material was not presented in an altogether satisfying or accurate fashion" or is limited to "yes" and "no" answers. I agree with you that the criminalist should take the initiative on the witness stand and do all that he/she can to avoid misunderstanding or misinterpretation. What should be and what is are often at variance. The very nature of people would indicate that some will control the stressful circumstances of the courtroom better than others. Based then on our individual experiences and perceptions, we disagree only about the frequency of this undesirable phenomena. I hope that these additional comments will allay your concerns.

Very truly yours,

JOHN K. VAN DE KAMP
Attorney General

S. C. HELSLEY, Chief
Bureau of Forensic Services

SCH:erc