California Association of Criminalists NEWSLETTER

MARCH 1984

CONTENTS

This mailing also includes the following items:

1. Minutes - Board of Directors Meeting October 19, 1983
2. Minutes - Business Meeting October 20, 1983 (for approval)
3. Minutes - Board of Directors Meeting December 2, 1983
4. International Association of Forensic Sciences Program Outline and Registration Documents
5. Proxy for the Spring Seminar in Monterey
6. Proposed By-Laws Change (to be voted on at the Spring Seminar)

UPCOMING MEETINGS

Southern Association of Forensic Scientists
April 4, 5 & 6, 1984. Myrtle Beach, North Carolina. Hilton Hotel, North Myrtle Beach. Contact: Betty Buchan; Sanford Crime Lab/FDLE; P.O. Drawer 1737; Sanford, FL 32771. (305) 323-4440.

Combined Meeting North-East and Mid-Atlantic Associations of Forensic Scientists
April 26 & 27, 1984. Atlantic City, New Jersey. Sands Hotel. Contact: Linda Jankowski or Pamela Townsend; New Jersey State Police South Reg. Lab.; Post Office Box 126; Hammonton, NJ 08037. (609) 561-2060.

Northwest Association of Forensic Scientists
May 2, 3 & 4, 1984. Coeur d'Alene, Idaho. North Shore Motel. For further information contact: Wally Baker; 2220 Old Penitentiary Rd.; Boise, ID 83702. (208) 334-2231.

Southwestern Association of Forensic Scientists
May 3, 4 & 5, 1984. Scottsdale, AZ. Doubletree Inn (at Scottsdale Mall). Hosted by the Arizona Department of Public Safety Phoenix Crime Laboratory. Blood Spatter and Head Lamp workshops will be included, as well as a Capillary Column Gas Chromatography School. Contact: Todd Griffith; Arizona Department of Public Safety Crime Lab, P.O. Box 6638, Phoenix, AZ 85995. (602) 262-8394.

CALIFORNIA ASSOCIATION OF CRIMINALISTS - SPRING SEMINAR 1984
May 9, 10, 11 & 12, 1984. Monterey, CA. Casa Munras Hotel (on the scenic Monterey Peninsula). Hosted by the California Department of Justice, Salinas Laboratory. Contact: Stephen Cooper, Seminar Chairman, California Dept. of Justice, 745 Airport Blvd., Salinas, CA 93901. (408) 443-3188.

IAI - 69th National Meeting
June 10 through 14, 1984. Anchorage, Alaska. Sheraton Hotel. Contact: IAI Alaska 84; 5700 E. Tudor Rd; Anchorage, AK 99507; Attn: LAB.

Sixth International Biodeterioration Symposium
August 5-10, 1984. Biodeterioration of Forensic Science Evidence and Materials. George Washington University, Washington, D.C. Contact: James L. Mudd; Forensic Science Research and Training Center; FBI Academy; Quanitco, Virginia 22135. (703) 640-6131.

Canadian Society of Forensic Science
August 18-24, 1984. Winnepeg, Manitoba. Viscount Gort Flag Inn. Contact: Executive Secretary, (613) 235-7112.

International Association of Forensic Sciences
September 18-25, 1984. Oxford, England. Contact: The Secretariat, 10th IAFS Meeting, Clarke House, 18 Mount Parade, Harrogate, HG1 1BX, England.

UPCOMING MEETINGS (continued)

Northwest Association of Foresnsic Scientists
October 3, 4 & 5, 1984. Medford, Oregon. Holiday Inn. Contact: Brad Telyea; 650 Royal Ave., Suite 11; Medford, OR 97501. (503) 776-6118.

Southern Association of Forensic Scientists
October 4, 5 & 6, 1984. Gulf Shores, Alabama. Gulf State Park Resort (on the beach) 1984. Contact: Grace Johanson; LSP Crime Lab; P.O. Box 66614; Baton Rouge, LA 70810.

CALIFORNIA ASSOCIATION OF CRIMINALISTS - FALL SEMINAR 1984
October 24-27, 1984. San Diego, CA. Hosted by the San Diego Police Department Crime Laboratory. Town and Country Hotel in Mission Valley. Contact: Jim Stam; San Diego Police Department; 801 Market St.; San Diego, CA 92101. (619) 236-6505.

Northeastern Association of Forensic Scientists
October 25, 26 & 27, 1984. New York, NY. Marriot Uniondale Hotel. Contact: Jeffrey Weber; DEA Northeast Lab; 555 West 57th St.; New York, NY 10019. (212) 399-5137.

CALIFORNIA ASSOCIATION OF CRIMINALISTS - SPRING SEMINAR 1985
To be hosted jointly by the Oakland Police Department Crime Lab and the University of California, Berkeley.

EMPLOYMENT OPPORTUNITY

CRIMINALIST, OAKLAND POLICE DEPARTMENT CRIMINALISTICS LABORATORY.
Two new positions are anticipated in mid 1984. Minimum qualifications will be a Bachelor's degree in criminalistics or a related physical science and two years fulltime laboratory experience and/or graduate work. Strong background in chemistry and/or serology is preferred. For further information contact: Jan S. Bashinski; Laboratory Director; Oakland Police Department; Criminalistics Section; 455 Seventh Street, Room 608; Oakland, CA 94607. (415) 273-3386.

ANNOUNCEMENTS

Steve Cooper Doing Well

Steve Cooper, our Membership Secretary and May Seminar Chairman, suffered a heart attack at the end of December and was off work for a couple of months. We are happy to report that he has had a complete recovery and has returned to work. Steve will be in full swing by the May Seminar and has re-assumed the Seminar Chairman duties.

CAC Speaker's Bureau

At the Fall Seminar a proposal was affirmed by the membership to create an informal "Speaker's Bureau" within the CAC. The group will consist of individuals volunteering to speak on such topics as laboratory services, technologies, and evidence handling. A number of members have already volunteered. If you are an experienced speaker and would like to have the opportunity to speak on behalf of your profession, your laboratory, or the Association, please write or call John DeHaan. Let him know the topics on which you would like to speak and the geographical area in which your services would be available. Names of groups potentially interested in speakers are also solicited.

ASCLD Scholarship Program Announced

The American Society of Crime Laboratory Directors (ASCLD) has recently set-up an ASCLD Scholarship Program.

This scholarship is designed to be a prestigious scholarship program for the recognition of outstanding forensic science students and to encourage students to pursue a career in the forensic science profession.

Each year, a maximum of two graduate students from an accredited university with a forensic science program will be selected to receive a $250 scholarship and a certificate of recognition.

Applications can be obtained by writing the ASCLD Scholarship Committee. The application must be returned with two letters of recommendation to ASCLD by December 15 of each year. The recipients will be notified by April 15, and the scholarship will be presented at the ASCLD Annual Meeting.

For further information, please contact: Dr. Henry C. Lee; Chairman, ASCLD Scholarship Committee; %Connecticut State Forensic Laboratory; 294 Colony Street; Meriden, CT 06450.

ANNOUNCEMENTS (continued)

Historical Committee Seeks Materials

Duayne Dillon, Historical Committee Chair, has announced that archival space will be made available to the CAC at the DOJ/BFS administration offices in Sacramento. Microfilm cameras and videotape copying services will be available. You are encouraged to share the notes, photos, and memorabilia with all of us in the criminalistics profession now, and those to come in future years.

Hiram Evans is now cataloging the CAC business archives for microfilming. Your help is needed now. Contact Duayne Dillon, Bob Ogle, or Fred Tulleners with a list of materials you have available. The CAC will make the necessary arrangements to duplicate the material and insure its safe return to you. Won't you help preserve this history before it's too late?

CLIS General Rifling Characteristics File Goes Off-Line

Al Biasotti of DOJ reports that on February 1, 1984, the Criminalistics Laboratory Information System (CLIS), General Rifling Characteristics (GRC) File will be removed from On-line NCIC access. At their September 1983 meeting, the Board of Directors of the American Society of Crime Lab Directors (ASCLD) approved of this action.

On this date, Evan Hodge, Supervisor of the Firearms Section at FBI Lab. gave the following status report on the CLIS/GRC file:

The FBI Lab will assume the responsibility for maintaining, updating, and providing periodic hard copy print-out of the GRC file. The last print-out distributed was dated November 9, 1982. The FBI has added about 150 new weapons since the last printing. They plan to print and distribute an update within the next two months.

Future plans are to revise the print-out program so it will not be necessary to print out more than x number of measurements for the same firearms that are the same.

Hodge also indicated that they were considering deleting the cartridge case data from the file because of the lack of examiners to do the required measurements. Al Biasotti strongly urged that they not delete the cartridge case and pointed out it requires little additional effort to record this data for new weapons; and costs nothing to maintain the existing cartridge case data in the file. He said they would reconsider their position on this point.

ANNOUNCEMENTS (continued)

Comittee Assignments Update

In addition to the committee assignments reported in the last Newsletter we have the following:

Training and Resources Committee: John Patty (chair)
Steve Cooper
Benny Del Re
Ed Rhodes
Jim Stam
Debbie Wakida

Certification Liason: Enrico Togneri

NOTICE -- ALL MEMBERS

The Board of Directors will hear an Ethics Matter at 9AM on Wednesday, May 9, 1984 at the Casa Munras Hotel, Monterey California. In accordance with the Enforcement Procedure for the Code of Ethics, this hearing will be open to CAC members as observers but not as participants. The specific location will be posted at the Hotel on the day of the hearing.

John D DeHaan
President

Feb.17,1984

ASSOCIATION ACTIVITIES

Northern Section Meeting - December 2, 1983

A Northern Section Meeting was hosted by the Contra Costa County Sheriff's Criminalistics Laboratory at Mulcrevys Restaurant and at the Presidio of San Francisco. Hosted by the Contra Costa County Sheriff's Criminalistics Laboratory. The speaker was Dr. Martin Fackler of the Wound Ballistics Laboratory at Letterman Army Institute of Research. Dr. Fackler spoke on wound ballistics and the use of the LAIR technique of test-firing into gelatin. The advantages of the technique were discussed along with potential uses in the interpretation of gunshot wounds.

ASSOCIATION ACTIVITIES (continued)

Southern Section Meeting - December 13, 1983

A Southern Section Meeting was hosted by the California Department of Justice Riverside Criminalistics Laboratory at the Hungry Tiger Restaurant in Corona. The speaker was Jay Hanks, Assistant District Attorney for Riverside County. The case of People vs. Harven, Harven, & Smith was discussed (also known as the "Norco Shootout Trial.") The incident left one Riverside Sheriff's Deputy and two bank robbers dead, ten other police officers shot or injured, 25 police vehicles damaged and out-of-service, and one helicopter shot down. The trial started June, 1981 and lasted 15 months. Expert testimony during the trial was discussed, focusing mainly on two experts called by the defense. The demeanor and quality of the experts' examinations were contrasted. Of particular concern to the speaker and the audience was testimony offered on blood spatter patterns. Ethical implications of the testimony and the basis for the opinions offered were discussed.

Northern Section Meeting - February 3, 1984

A Northern Section Meeting was hosted by the San Mateo County Sheriff's Forensic Laboratory at The Bailey in San Mateo, hosted by the San Mateo County Sheriff's Forensic Laboratory. The speaker was Dr. Michael Hecker of SRI International. Dr Hecker spoke on Forensic Acoutistics, giving a brief synopsis of tape authentication, voice identification, firearms acousitics, and intelligibility enhancement.

STUDY GROUP MEETINGS

(The following Study Groups are currently active. For further information regarding one of these groups, or to be placed on the mailing list, contact the member listed.)

Trace Evidence Study Group - North (T. Spear, M. Blake)

12/15/83 and 3/17/84. The group met on both dates at Oakland Police Department to discuss current literature concerning trace evidence analysis.

Trace Evidence Study Group - South (S. Wiersema, E. Rhodes)

12/13/83. The group met at the Hungry Tiger Restaurant in Corona. Topics for discussion included review of the Yosemite Joint Trace Meeting and the extraction and thin layer chromatography of dyes from fibers. John Sims and Sandy Wiersema distributed hand-outs on these fiber dye techniques. Attendees brought samples of carpet fibers to be analyzed by one laboratory using the various TLC systems.

ASSOCIATION ACTIVITIES (continued)

Serology Study Group - South (B. Johnson, D. Sugiyama, C. Rhodes)

12/8/83. At the Orange County Sheriff's Department. The guest speaker was Lynn Delapointe from Long Beach Memorial Hospital, who spoke on Gc subtyping by iso-electric focusing. A sexual assault data sheet was distributed to all labs. Case information is to be tallied for the next six months, at which time C. Rhodes, D. Sugiyama and B. Johnson will collect data for compilation. The production of training films for serology was also discussed.

1/19/84. Discussion of report writing continued from the October meeting. Data from a hypothetical case data had been distributed, and members were asked to write reports. There was discussion about whether or not conclusions, or just results, should be included in a report. Of particular concern was the use of statistics. Where and how should they be used? Because there was such a large discrepancy in the phenotype frequencies reported in the first hypothetical case, the group decided to repeat the excercise.

Kieth Inman gave a case report wherein a substance with the outward appearance of blood failed to give a presumptive test. Concluding discussions were multi-topics: problems people have had with Group IV; identifying Hb on Group IV; unusual cases, etc.

Serology Study Group - North (M. Gibbons)

2/13/84. The group met at Oakland Police Department to discuss existing sexual asault evidence collection and preservation protocols and to suggest what changes, additions or improvements can be made in Title 22.

Drug Study Group (D. Clardy)

12/13/83. The group met at the Hungry Tiger restaurant in Corona. Margaret Kuo and Richard Bingle reviewed the various new legislations that would be going into effect on January 1, 1984. Among them are AB 1023 and AB 982. The legal definition of an ounce is 28.5 grams with a half ounce defined as 14.25 grams.

Hiram Evans was appointed the committee chairman of the legislative committee to make recommendations to the legislators on introducing new legislation and amending existing ones.

Computer Study Group (P. Barnett)

1/13/84. The group met at Forensic Science Associates. Plans to computerize literature abstracts were discussed. No further meetings have been scheduled.

GENESIS OF THE
CALIFORNIA ASSOCIATION OF CRIMINALISTS

By: LOWELL W. BRADFORD

When I first entered into the field of Criminalistics in 1947 in the California State Crime Laboratory in Sacramento, the only existing organization for the exchange of professional information in identification work was the California Division of the International Association for Identification. This small group had its origin from the identification officers of the Berkeley, Oakland and San Francisco Police Departments, Sheriff Department of Alameda County and some of the other major cities and counties in California. This group had formed in earlier years and was responsible for the formation of the statewide fingerprint bureau in the California Department of Justice in Sacramento. This state unit developed into the Criminal Identification and Investigation Division which included a Technical Laboratory Section. The laboratory when I joined the staff in 1947 was staffed by Roger S. Greene and David Q. Burd.

Dave Burd took me to an IAI meeting one evening where I met the leaders of the identification bureaus. This was a very serious group of fingerprint specialists who were hungry for information on new scientific approaches to physical evidence identification processes. They performed the role at

that time of what we know as crime scene search technicians and coordinated the physical evidence collection work within their respective departments. Some had gone so far as to acquire microscopes and were involved in bullet comparisons and document examinations. The group looked toward those of us in the laboratory for help and guidance in physical evidence utilization with a great deal of fervor and zeal. Consequently, we were asked frequently to present program material for their continued education. They also provided significant political support for the inauguration of local crime laboratories.

In those days, the terms Criminalistics and Criminalist were not in use. Those of us in the State Crime Laboratory had civil service position titles of CRIMINOLOGIST. It remained for James P. Osterburg to publish "AN INTRODUCTION TO CRIMINALISTICS" in 1949, which marked the beginning of the usage of "Criminalistics" and "Criminalist" in this county. "CRIME INVESTIGATION" by Paul L. Kirk in 1953 closely followed and gave full meaning to "Criminalistics". Chapter 33 of his first edition contains doctrine which is worth frequent review.

This was the scenario in which the embryo of the C.A.C. was formed. In 1953 I attended a state meeting of the IAI in Laguna Beach together with my colleague, James W. Brackett, Jr. There for the first time we met Ray Pinker and Clark Sellers of Los Angeles, who were also on the program. It was our first opportunity to talk shop with someone in Criminalistics

from California. We learned from Ray Pinker of the identities of other crime laboratory people in southern California. In our discussions we thought that it would be of value to have a shop talk meeting of all Criminalists in California.

In February 1953 I sent letters of invitation to every Criminalist in California (there were only 16) to attend a seminar session on April 11, 1953 to present and discuss current technical developments and professional matters. The meeting was held on that date at the Laboratory of Criminalistics, Dept. of District Attorney, San Jose, which was located in the Santa Clara County Hospital. The meeting took place in the hospital library because the laboratory contained only 600 square feet of well used space. In 1954 a formal organization was formed with the name: CALIFORNIA ASSOCIATION OF CRIMINALISTS.

It was agreed to not schedule a meeting for a particular date unless it would accommodate 100% of the invitees. The group was so small that the consensus was that the import of meeting content would be wasted without 100% participation. During the early years, missing two consecutive meetings was grounds for expulsion.

I was elected executive secretary and held that position for four consecutive years. There were no dues, only periodic assessments to meet costs which were very small. We published a newsletter of abstracts that were presented at seminars. The constitution was changed eventually to provide for a president and other officers. I published "THE CALIFORNIA ASSOCIATION

OF CRIMINALISTS" in the Journal of Criminal Law, Criminology and Police Science, Vol 53, No 3, Sept 1962 in order to announce our existence.

In 1963, Paul L. Kirk and I attended the 1st International Meeting in Forensic Toxicology in London. There we met members of the Forensic Science Society (of Great Britain). We worked out an arrangement for the C.A.C. to utilize the Journal of Forensic Science (organ of The Forensic Science Society) as our official publication after the Journal of Forensic Sciences (organ of The American Academy of Forensic Sciences) had rejected us.

Meanwhile, the semi-annual seminars continued like clock-work so that the meeting in San Francisco in the spring of 1983 marked the 30th anniversary of the C.A.C. and its seminars. Aside from bringing forth an exchange of information forum, our greatest achievement has been the creation of a Code of Ethics, which has had a significant impact upon the profession.

The people present at the first meeting were as follows:

		Status in 1953	Status in 1983 (May
1.	Brackett, James W., Jr.	Asst. Criminalist, Santa Clara County	Director, Laboratory of Criminalistics, Santa Clara County
2.	Bradford, Lowell W.	Director, Laboratory of Criminalistics, Santa Clara County	Independent Consultant in Forensic Science
3.	Briglia, Ronald J.	Asst. Criminalist, Orange County	Toxicologist, Sacramento County
4.	Burd, David Q.	Criminologist, State of California	Retired
5.	Cadman, W. J.	Chief Criminalist, Orange County	Prof. of Criminalistics, Los Angeles State College
6.	Davis, John E.	Criminalist, Oakland P. D.	Retired
7.	Fuller, Patrick	Asst. Criminalist, Oakland P.D.	Resigned
8.	Greene, Roger S.	Criminologist, State of California	Deceased
9.	Harding, Donald F.	Criminalist, Pasadena P.D.	Supervising Criminalist, Laboratory of Criminalistics Santa Clara County
10.	Jones, Lee F.	Asst. Forensic Chemist, Los Angeles P.D.	Deceased
11.	Kirk, Paul L.	Prof. of Criminalistics, U. C., Berkeley	Deceased
12.	Lacey, George	Chief Forensic Chemist, Los Angeles S. O.	Retired
13.	Pinker, Raymond	Chief Forensic Chemist, Los Angeles P. D.	Deceased
14.	Reeves, Hillard	Criminalist, Richmon[illegible]. D.	Deceased

SEROLOGY HANGING BY A THREAD

(text of paper presented by M. Blake at Spring Seminar of C.A.C., May, 1983, San Francisco)

Trace Evidence by M. Blake - Oakland Police Department
Serology Examination by J. Bashinski - Oakland Police Department
and E. Blake - Forensic Science Associates

During a recent armed robbery in a small market in Oakland, gunfire was exchanged between the male Chinese storekeeper and two suspects, both described by witnesses as black males. The storekeeper, who was mortally wounded, was taken to the county hospital. Shortly after the robbery occurred, a black male was admitted to the county hospital with a gunshot wound in the right arm. On this same day, the police received an annonymous phone call with a message that the person who had robbed and shot the storekeeper had himself been wounded during the robbery and had been taken to a hospital in Oakland, probably the county hospital. A robbery detective went to the county hospital to investigate the robbery of the market and found the Chinese victim and a black male gunshot patient separated by one bed in the intensive care unit. The detective interviewed the robbery victim who could not talk but could nod his head in response to questions. The male black patient appeared to be very interested in the interview being conducted one bed away. The robbery victim indicated that he had fired his revolver and thought that he had hit one of the robbers in the right arm. The robbery victim died one week later. Subsequent investigation showed that the male black patient's story explaining his gunshot wound was unsubstantiated, and he became a primary suspect in the robbery-murder of the Chinese storekeeper.

I. Serology

When the scene was processed a bullet was located which was later identified as being fired from the victim's gun. The nose of this bullet was covered with bloody tissue and a mass of predominantly white fibers with black fibers interdispersed. The obvious first step for the serologists was to type the tissue to the nth degree and compare the types to the suspect and victim. The main serological problem in the case was, of course, how to obtain the most typing information from the small sample of tissue collected from the bullet, while preserving the bulk of the fibers for other analysis. The tissue sample was only slightly red, indicating only a small amount of blood present. Therefore they concentrated first on looking for markers, especially PGM, which they knew would be very strong in tissue. Secondly, it was important to try to discriminate between the suspect, a black male, and the victim (Chinese) in the case, to dispel any allegation that the victim was shot with his own gun. They did screen the suspect in TF, CAII and PEPA, but he did not have any of the variant types. Although the suspect and victim were different HP types they did not anticipate being able to type HP on the bullet because of the small amount of blood.

The basic scheme followed in the serological work is outlined in Figure I. Under the stereomicroscope the sample was seen to consist of dried tissue, fibers coated with blood and tissue, and relatively unstained fibers.

For the first step they carefully excised as much of the unstained fiber mass as possible from the sample so that it could be examined independently. In the second step they extracted the entire remaining sample in Clellands and divided the extract in half. One half was diluted, divided in half again and taken up on threads and for step three: typing in PGM subtyping and Group I. The other half was held in reserve until they were sure this typing would not have to be repeated. Once this was ensured they typed the remaining extract in Group II, which was step four. They were fairly sure they would get AK and possibly typable ADA but had their doubts about EAP. As it turned out they didn't find any EAP activity. Once the enzyme typing was complete they turned to ABO typing bringing us to step 5. They first tried to extract the antigens in methanol then dry the extract on threads and type the ABO but that was unsuccessful for the evidence and controls. They then resorted to dividing the tissue and tissue-coated fibers, which had been fixed by the methanol extraction into roughly three equal parts and doing absorption eluation (step 6) by the Howard-Martin technique directly on the sample This was successful.

Table I shows the final results obtained from the bullet and its comparison with the victim and suspect's types. The initial information we had from the investigator was that the victim had not been transfused. However, upon examining the GLO pattern it became apparent that a mixture of types was present. They hoped to find a difference between the two in GLO, because of its high discrimination index, but after going back to the victim's clothing they found that he, like the suspect, was GLO type two. In fact, as you can see going across the chart, the victim and the suspect were the same type in all the systems they were able to type on the bullet. So even though they were able to develope a combinatinn of types which occurs in only about 2% of the population, they were unable to discriminate between these two individuals.

II. Trace Evidence

As can be seen, fibers located on the nose of the bullet took on new importance, especially after the clothes of the suspect were examined. The suspect was wearing a blue T-shirt when admitted to the county hospital. This shirt, which consisted of blue cotton fibers, had a series of apparent bullet holes in the right sleeve. The series of holes is consistent with the fabric being folded over onto itself, which occurs when an arm is lifted. Adhering to one of these holes was a mass of predominantly white fibers with black fibers interdispersed. All items of clothing on the suspect and victim were eliminated as possible sources of these fibers. The questions became; can the two sets of fibers, i.e. the fibers on the bullet I previously described and the fibers located on the shirt be associated as to possible common origin and from what source could they have originated?

I first examined the mass of fibers from the bullet and found, among other fibers, a yarn which consisted of white and black fibers in a ratio of approximately ten white to one black. The white fibers were identified as acrylic fibers (based upon optical proberties) and the black fibers were eventually identified as rayon, but not without some difficulty.

Due to heavy pigmentation, I was not able to measure birefringence or other optical properties, or determine the cross-section by longitudinal examination. Attempts to extract what I thought was a dye were unsuccessful and it appeared that the pigmentation was probably carbon and was not going to extract. The black fibers were finally identified as rayon based upon melting point and solubility.

The fibers removed from the suspect's shirt also consisted of a yarn composed of white and black fibers in the same approximate ratio as the bullet fibers. These fibers were also identified as white acrylic fibers and black rayon fibers and were indistinguishable from the bullet fibers.

The next question was: where would we expect to encounter a yarn which is a mixture of white acrylic fibers and black rayon fibers? At least one of the witnesses to the fleeing suspects in the robbery recalled seeing one of the suspects wearing a green army jacket and the other wearing a grey sweatshirt. The green army jacket was eliminated as a possible source; the grey sweatshirt seemed worthy of pursuit.

Two separate but associated paths of fact-finding were pursued. First, I began compiling a list of fiber types found in various brands of grey sweatshirts. I did this by hanging out in various department and sporting goods stores with a notepad crawling in and out of racks. I found out the following: most grey sweatshirts, like other sweatshirts are a blend of cotton and acrylic, but some list rayon at 5%; others contain polyester, and some do not contain acrylic.

My second path of investigation involved contacting various fabric, yarn and fiber producers in America to determine common end-uses of black rayon fibers. Since white acrylic fibers are quite common, I was mainly interested in determining the frequency of black rayon with white acrylic in a yarn form. Based upon conversations with representatives from Panile Knitting Company, Kindley Cotton Mill, Courtalds, North American Rayon Association, American Enka Corporation, and Man-Made Fiber Producers, I was able to obtain the following information.

1. Most sweatshirt fabric is manufactured in 3 or 4 mills in U.S.

2. The grey sweatshirt fabric is called gun metal grey and is usually composed of white acrylic fibers mixed with colorfast black rayon fibers called coloray. (These fibers are produced by adding carbon to the viscose before extrusion. Rayon is used because it accepts the carbon so well).

3. Since rayon comprises less than 10% of the total fabric, the manufacturers are not required to list it on the label.

4. To the best of my knowledge the only domestic source of black rayon fibers is Courtalds and the end-use of black fibers depends on what denier it is. The range of 1.5 to 2.2 denier is used for apparel, mostly grey sweat-clothing. (Denier relates to the coarseness of a filament and is defined as the weight, in grams, of a 9,000 meter length of the filament). Deniers

equal to or greater than 3 would most likely be associated with an industrial end-use product, and as such would not be associated with white acrylic fibers. Courtalds provided me with samples of 1.5, 2.2, and 3 denier black rayon fibers. I compared the 1.5 and 2.5 denier samples to the evidence rayon fibers by examining the diameters of these fibers. An overlap was observed among the 1.5 and 2.2 denier fibers and some of the evidence fibers matched each of these deniers. The 3 denier rayon was thicker than the other deniers and all of the evidence fibers.

So, in this case, even without a known item of apparel for comparison purposes, the fiber evidence supported witness descriptions of the clothing worn by the suspect as he fled the scene and provided evidence of an association between the bullet at the scene and the suspect.

Figure 1.

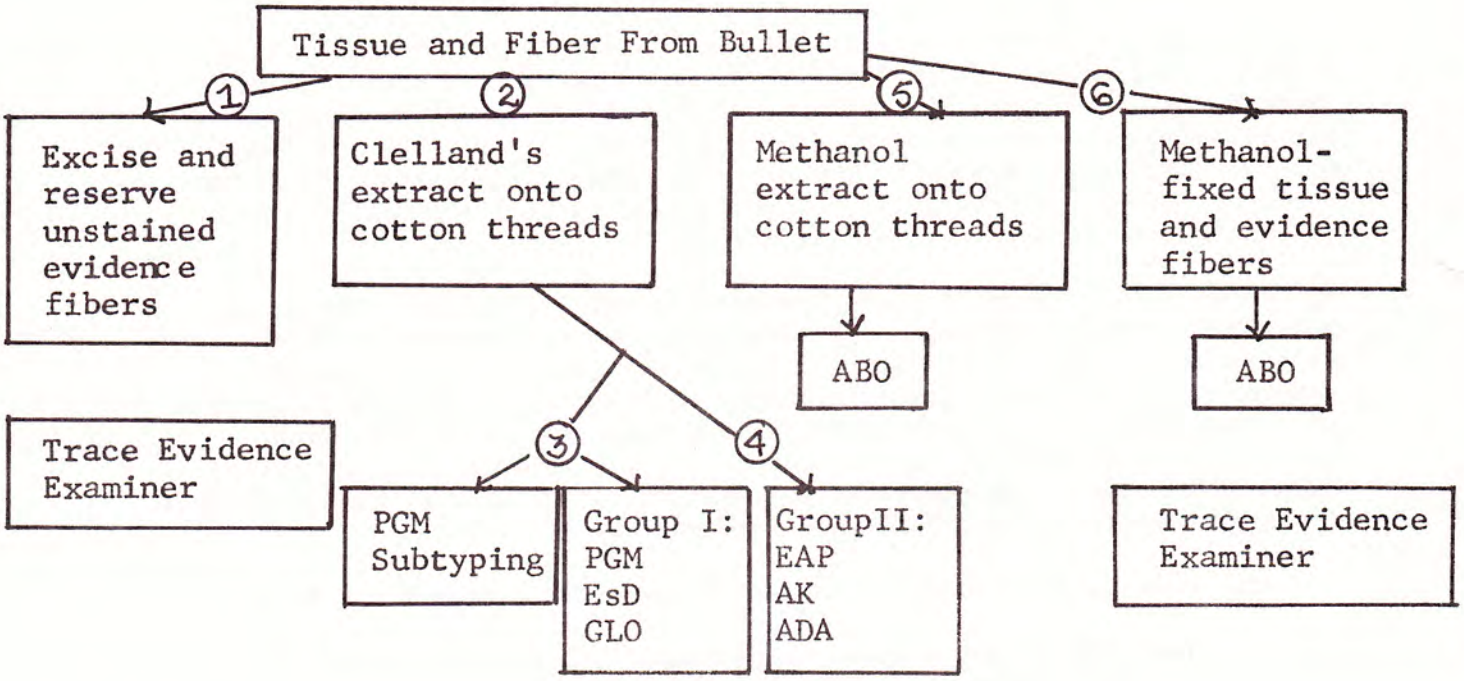

TABLE I

	ABO	EsD	PGM	GLO	AK	ADA	EAP
SUSPECT	B	1	2+1+	2	1	1	B
VICTIM (autopsy)	B	1	2+1+	mix	1	1	BA (possible mixture)
VICTIM (clothing)	B	1	--	2	1	1	B
TISSUE (from bullet)	B	1	2+1+	2	1	1	no activity

Standards also screened in Hp, Gc, Tf, PepA and CAII.

FIBER DYE EXTRACTION AND TLC

(compiled by Sandy Wiersema)

GENERAL PROCEDURE (12)

A single fiber 1-2 cm in length is placed in a capillary tube approximately 1 mm in diameter x 100 mm. Approximately 5 µℓ of the extracting solvent is added and both ends of the tube are sealed. The tube is then heated in an oven for approximately 20 minutes at the temperature indicated for each extracting solvent. A control tube is prepared using a single fiber with distilled water as the solvent. The intensity of color and the amount of dye extracted from the fiber can be compared to this control. The amount of dye extracted is assessed on a 0-5 scale, 0 corresponding to no extraction and 5 to complete extraction.

The extracted dye is then spotted on Merck DC-Fertigplatten Silica Gel TLC plates using a stream of warm air for drying. In some instances the TLC spot is concentrated by running the plate in Methanol for a distance of 2-3 mm before immersing in the TLC solvent system.

Resua (14) reports a somewhat similar method of dye extraction from bundles of fibers using pyridine/water (53:47 v/v) as the extracting solvent. The dye is then spotted on Merck Silica Gel 60F-254 plates as above. A screening TLC system Chloroform/Methanol/Glacial Acetic Acid (70:20:10) is employed to determine the dye category. Disperse dyes move with the solvent front. Acid and basic dyes are mobile and can be assigned Rf values. Direct, vat and reactive dyes remain at the origin.

General TLC systems are then chosen based on the behavior of the dye in the screening TLC system. (14) He also evaluates several paired solvent systems for the comparison of extracted dyes by TLC using Rf correlation. (15)

FIBERS AND MOST PREDOMINANT DYE TYPE

Acetate & Triacetate:

Disperse dyes predominant.

Acrylic:

Basic dyes predominant, disperse dyes less common.

Cellulosic (cotton & viscose):

Multiple dyes used-direct dyes (cheap fabrics), vat dyes sulfur dyes (most commonly used to produce blacks, browns and deep blues particularly on overalls), reactive dyes.

Nylon:

Acid dyes predominant, disperse and direct dyes less common.

Polyester:

Disperse dyes predominant.

Wool:

Acid dyes predominant, however multiple dyes used.

ACETATES AND TRIACETATES

EXTRACTION SOLVENTS (2)

Pyridine/Water	(4:3)	100°C

TLC SYSTEMS

(no published method found)

ACRYLIC

EXTRACTION SOLVENTS (3)

Pyridine/Water	(4:3)	100°C
Formic Acid/Water	(1:1)	100°C
Formamide		135°C

TLC SYSTEMS - Basic dyes (4)

Chloroform/i-Propanol/Pyridene/Acetic Acid/Water (6:8:3:1:1)

Chloroform/MEK/Acetic Acid/Formic Acid (8:6:1:1)

CELLULOSIC FIBERS

COTTON & VISCOSE

EXTRACTION SOLVENTS

reactive dyes - NaOH (1.5% aqueous soln)		100°C	(9)
direct dyes - Pyridine/Water	(4:3)	100°C	(7)
vat dyes - DMF & Chloroform		100°C	(7)
indigo (vat dye) - Pyridine/Water	(4:3)	100°C	(7)

TLC SYSTEMS

Reactive Dyes (9)

- Methanol/Amyl Alcohol/Water (5:5:2)
- n-Propanol/Methanol/Water/Ammonia (8:6:2:1)

Direct Dyes (7)

- n-Butanol/Ethanol/0.88 Ammonia/Pyridine/Water (8:3:4:4:3)
- Pyridine/i-Butanol/0.88 Ammonia (3:2:2)
- Pyridine/Amyl Alcohol/0.88 Ammonia (4:3:3)

Vat Dyes (7)

- no good system found
- Toluene/Pyridine (3:2)
- Butyl Acetate/Pyridine/Water (5:4:2)
- Butanol/Butyl Acetate/Nitrobenzene/Acetone (3:3:3:1)

NYLON

EXTRACTION SOLVENTS (3)

Pyridine/Water	(4:3)	100° C
DMF/Formic Acid	(1:1)	100° C
Formamide		135° C

TLC SYSTEMS - Acid dyes (4)

Chloroform/Water/Methanol/0.88 Ammonia	(11:1:7:1)
n-Butanol/Acetic Acid/Water	(2:1:5)
n-Butanol/Ethanol/0.88 Ammonia/Pyridine	(4:1:3:2)

TLC spots preconcentrated by developing in Methanol for a distance of 2 - 3 mm.

POLYESTER

EXTRACTION SOLVENTS (3)

disperse dyes - Chlorobenzene 130°C

basic dyes - Pyridine/Water (4:3) 100°C

TLC SYSTEMS - Disperse dyes (4)

Toluene/Pyridine (4:1)

n-Hexane/Ethyl Acetate/Acetone (5:4:1)

Toluene/Methanol/Acetone (20:2:1)

TLC spots preconcentrated by developing in Methanol for a distance of 2 - 3 mm.

WOOL

EXTRACTION SOLVENTS (13)

Pyridine/Water	(4:3)	Room temp or 100° C

TLC SYSTEMS (12)

Pyridine/Amyl Alcohol/10% Ammonia (4:3:3)

i-Butanol/Acetone/Water/4% Ammonia (5:5:1:2)

Chloroform/Water/Methanol/0.88 Ammonia (11:1:7:1)

TLC spots preconcentrated by developing in Methanol for a distance of 2 - 3 mm.

EXTRACTION AND TLC OF DYES FROM FIBERS

A Selected Bibliography

CAC Southern Section
Trace Evidence Study Group

December, 1983

1. Beattie, B., et al., "Thin layer chromatography of dyes extracted from polyester, polyamide and polyacrylonitrile fibres," HOCRE Rpt. #319, Aug. 1979.

2. Beattie, Beryl et al., "The extraction and classification of dyes from cellulose acetate fibres," J Forens. Sci. Soc., 21, 1981, 233.

3. Beattie, I. B., et al., "The extraction and classification of dyes on single nylon, polyacrylonitrile and polyester fibres," J. Soc. Dyers & Colourists 95:8, 1979, 295.

4. Beattie, I. B., et al., "Thin-layer chromatography of dyes extracted from polyester, nylon and polyacrylonitrile fibres," For. Sci. Int. 17, 1981, 57.

5. Biology Methods Manual, Metropolitan Police Forensic Science Laboratory, London, 1978, p. 6-26.

6. Clodfelter, Ronald W. and Hire, Jerry W., "An alternative method for the thin-layer chromatographic examination of fabric dyes," Can. Soc. For. Sci. J. 13:1, 1980, 9.

7. Home, J. M. and Dudley, R. J., "The extraction and classification of dyes from cotton and viscose fibres," HOCRE Rpt. #340, February 1980.

8. Home, J. M. and Dudley, R. J., "Revision of the scheme for extraction and classification of dyes from polyacrylonitrile fibres," HOCRE Rpt. #343, February 1980.

9. Home, J. M. and Dudley, R. J., "Thin-layer chromatography of dyes extracted from cellulosic fibres," For. Sci. Int. 17, 1981, 71.

10. Laing, D. K. and Boughey, Laura, "The standardisation of thin-layer chromatographic system for comparison of fibre dyes," HOCRE Rpt. #422, December 1981.

11. Lloyd, J. B. F., "Forensic significance of fluorescent brighteners: their qualitative TLC characterisation in small quantities of fibre and detergents," J. Forens. Sci. Soc. 17, 1977, 145.

12. Macrae, R. and Smalldon, K. W., "Thin layer chromatography of dyes extracted from wool fibres," HOCRE Rpt. #225, May 1977.

13. Macrae, Robert and Smalldon, K. W., "The extraction of dyestuffs from single wool fibers," J. Forens. Sci. 24, 1979, 109.

14. Resua, Ronald, "A semi-micro technique for the extraction and comparison of dyes in textile fibers," J. Forens. Sci. 25, 1980, 168.

15. Resua, Ronald, et al., "The evaluation and selection of uncorrelated paired solvent systems for use in the comparison of textile dyes by thin-layer chromatography," J. Forens. Sci. 26:3, 1981, 515.

Ethical Dilemma

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The body of a young women was found in a secluded area. Autopsy examination revealed she had been severely beaten. Investigation revealed that she had been seen the evening of her reported disappearance with two young men whose identities were soon established. Based on this information, the police obtained a search warrant and searched the residences of the suspects. In the bedroom closet of Suspect #1, hanging on a hook, was found a pair of blue overalls. Blood samples from each of the suspects were also obtained.

The overalls were submitted to the laboratory with a request to examine them for blood and to compare any blood found with the blood samples from the two suspects and the victim.

Initially, the ABO and PGM types of the blood samples of the two suspects and the victim were determined as follows:

Run #1:

	ABO type	PGM type
Suspect #1	A	1-1
Suspect #2	B	2-1
Victim	A	2-1

Examination of the overalls revealed a small bloodstain on the front of the bib portion. Without doing any species determination, the criminalist decided to do PGM subtyping of the stain and the blood samples from the suspects and the victim. The results of this analysis are shown below:

Run #2:

Sample	PGM subtype
Suspect #1	1+
Suspect #2	1+
Victim	[overloaded]
2+2-(std)	2+2-
1+1-(std)	No reaction
Overalls	2+1+

Because of the discrepancy in the PGM type for Suspect #2 in the first and second determinations, and due to the inability to determine the PGM subtype of the victim from the second analysis, a third determination was done, with the following results:

Run #3:

Sample	PGM subtype
Suspect #1	1-1-
Suspect #2	2-1+
Victim	2+1+
2+2-(std)	2+2-
1+1-(std)	1+1-

The report that was issued stated that the victim was PGM type 2+1+, Suspect #1 was 1-1-, and the stain on the overalls was 2+1+ and was, therefore, compatible with being the victim's blood but not compatible with the suspect's own blood.

Note that in the second typing determination, of the six samples run, no results or incorrect results were obtained in at least 4 samples, including one of the standards. Specifically, no "correct" 1- band appeared on the plate, and the bands which had originally been identified as 1+ bands (for Suspect #1) were later found to be 1- bands. In spite of the obvious discrepancies and errors made in run #2, the analysis of the stain on the overalls was not rechecked.

It is the stated policy of the laboratory that all reports are subjected to management review specifically directed to assuring that any conclusions expressed in the report are supported by data in the analysts notes.

QUESTIONS:

1. Does the data justify the conclusions as expressed in the report? Should the analyst have recognized the problems in the second set of PGM determinations and repeated all of the analyses from that particular run?

2. Should the criminalist's supervisor have caught the discrepancy between the data and the report? Is part of being ethical doing a competent job, whether that be at the bench or as a supervisor?

3. Is the failure to do a species determination, whether by oversight or design, acceptable practice? If not, is it unethical?

4. Can a criminalist who has re-examined evidence for the defense, and who has found some of the evidence to be damaging to the defendant, testify about the improper conclusions expressed in the laboratory report without, at the same time, being required to testify about the damaging evidence he has found?

5. If the discrepancy between the data and the conclusions expressed in the report is not noticed by the criminalist's supervisor, and the defense attorney is precluded from calling his own witness because the re-analysis is less favorable to the defendant, what mechanism does the profession of criminalistics have to ensure quality control?

The responses to the last Ethical Dilemma (in which the criminalist was asked to testify at a Hitch motion concerning the failure of the police to preserve evidence that he had, in fact, obtained) brought two opposing views, both from consultants. Parker Bell states,

> . . .I feel the answer is clear enough that it should not be titled a dilemma. I can see little doubt that the criminalist testifying "if I had the bottle, I could determine. . ." is misleading the judge when, in fact, he already has the bottle. . .
>
> I feel that even if the criminalist answers the questions truthfully he has violated his ethical duty if his answers implant a false impression in the mind of the judge or jury; withholding information of this type is equivalent to an absolute false declaration.

The opposing view comes anonymously and concludes that the criminalist would have committed no ethical violation by testifying about what analysis could have been performed if the bottle had been recovered by the police:

> An attorney can call a witness whether or not the witness is willing to be called. A witness must answer the question if he knows the answer. If he does not know he must say so.
>
> . . .the issue is not whether or not the witness testifies[but]. . .what he says. If he gives technically correct answers, does not volunteer and refuses to speculate or argue, the ethical question does not arise.

Response Sheet

March

The criminalist has___ has not X committed an ethical violation in failing to do a species determination?

The criminalist has X has not___ committed an ethical violation by failing to recheck the results of the PGM subtype determination on the overalls?

The criminalist's supervisor has X has not___ committed an ethical violation in failing to have the criminalist resolve the discrepancy between the data and the conclusions?

Please check if you are a supervisor X

COMMENTS:

There are obvious problems with the analytical data. Not only are the subtyping results on the evidence in question in view of the problem with the standards on run #2, but the conventional typing results in run #1 are also in disagreement with the eventual conclusions as the the PGM subtype of one of the suspects. This discrepancy could hardly be termed subtle and one would expect it to be caught by the supervisor (assuming all the data was made available to the supervisor at the time the report was issued) and of course should have been of concern to the analyst and should have been resolved by re analysis before issuing a report. ~~Although~~ In many cases there is a thin line between mere "ignorance" or "incompetence" and unethical behavior. However, in this instance the fact that the data do not support the conclusion is so obvious that to ignore it would ~~[illegible]~~ constitute an ethical violation.

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