



NEWLETTER

California Association of Criminalists

NEWLETTER

OFFICERS 1982-83

SEPTEMBER 1982

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This mailing includes the following items:

1. Proxy for Fall Seminar. Please designate a proxy if you cannot attend the Sacramento meeting.
2. Preliminary Schedule, Fall Seminar.
3. Board Meeting Minutes, May 13, 1982.
4. Business Meeting Minutes, May 14, 1982.
5. Call for Awards Nominations.

ASSOCIATION ACTIVITIES

Northern Section Meetings

On June 25th Gary Harmor and the Serological Research Institute hosted a dinner meeting with guest speaker James R. Jenner, Alameda County Public Defender. Mr. Jenner spoke on the role of the public defender in the criminal justice system, emphasizing the hazards of eyewitness testimony and the importance of preserving the rights of the accused. On August 26th Carol Harralson and the Contra Costa County Criminalistics Laboratory hosted a dinner meeting featuring guest speaker Dr. James R. Penton, Data Systems Product Specialist with Perkin/Elmer Corporation. Dr. Penton spoke on computer applications in forensic science, discussing computer terminology and the interfacing of computers with analytical instrumentation.

Southern Section Meeting

In July, a Beach/Party picnic was planned by Jay Mark of the Huntington Beach Police Department Crime Lab. The topic was to be Crime Scene Video Techniques. Unfortunately the speaker became ill and the meeting was cancelled.

Northern Trace Study Group

June 10: San Mateo Police Department. The group discussed the results of the carpet fiber practical exercise where seven outwardly similar brown carpet fibers were compared to see if they could be discriminated. A variety of examination techniques were used and the results were compiled.

July 15: Oakland Police Department. David Stoney (Institute of Forensic Science) discussed "A Theoretical Framework for the Interpretation of Fiber Evidence," which included discussion of fiber transfer models and the criteria used to infer that contact has occurred.

August 19: Bureau of Home Furnishings (Department of Consumer Affairs), Sacramento. The group was given a tour of the Bureau which is responsible for testing materials used in furniture, pillows, etc., for content and for flammability requirements. Bureau staff also discussed down feather identification and fiber identification by color change reactions, solubility tests, and instrumental techniques.

The next meeting will be at Oakland Police Department on September 30 when the results of a cordage fiber practical exercise will be discussed. On October 15 and 16 the group will meet with members of the Southern Trace Study Group in Yosemite Valley to commemorate two years of Trace Evidence Study Group activities.

Southern Trace Study Group

The group met on August 13 at the Orange County Sheriff's Crime Laboratory. Jim White led the discussion of the analytical methods currently being used by the Southern Section labs for paint analysis. The group concluded that no one is doing paint in a systematic manner. Paint samples were distributed for the comparison and evaluation of analytical methods. Ed Rhodes "volunteered" to be the new chairman of the trace group. In the future, meetings will be held approximately every six weeks.

Southern Drug Study Group

The group met on August 13 at the Huntington Beach Police Department. Carole Sidebotham presented an extraction technique for the infrared identification of psilocyn in mushrooms. She also reacquainted the newer criminalists with the method for purifying mescaline from Peyote which was printed in Microgram: Levine, J., "Identification of Mescal Buttons (Peyote)." Microgram I: 4 (1968) p. 28.

UPCOMING MEETINGS

California Association of Criminalists - First Inter-American Congress of Forensic Sciences

November 1-5, 1982. Sacramento, California. Contact John DeHaan, Calif. Dept. of Justice Laboratory, P.O. Box 13337, Sacramento, CA 95813.

Mid-Atlantic Association of Forensic Scientists

Joint meeting with the Society of Forensic Toxicologists, October 13-15, 1982. Rosslyn, Virginia. Contact Dr. Marina Stajic, Office of Chief Medical Examiner, Fairfax Hospital, 3300 Gallows Rd., Falls Church, VA 22046, (703) 560-7944 or Dr. Tony Cantu, BATF National Lab, Rockville, MD 20850, (301) 443-5213.

Northwest Association of Forensic Scientists

October 6-8, 1982. Portland, Oregon. Contact George Matsuda, Oregon St. Police Crime Laboratory, 222 S.W. Pine St., Portland, OR 97204 (503) 229-5017 or 248-5736.

Northeastern Association of Forensic Scientists

October 22-23, 1982. Albany, New York. Contact R.C. Herrmann, New York State Police Crime Laboratory, State Campus Bldg. 22, Albany, New York 12226.

Asian Pacific Congress on Legal Medicine and Forensic Sciences

September 18-22, 1983. Singapore. Contact Dr. Wee Keng Poh, Medico-Legal Society, 4-A College Rd., Singapore 0316.

International Association of Forensic Sciences

Summer 1984. Oxford, England. Contact IAFS, c/o Forensic Science Society, P.O. Box 41, Clarke House, Harrogate, North Yorkshire, GH1 1BX, England.

California Association of Criminalists Spring 1983

May 12-14, 1983. San Francisco, California. It will be at the Union Square Holiday Inn. Contact Debbie Wakida, San Francisco Police Department Laboratory, 850 Bryant St., San Francisco, CA 94103, (415) 553-1161.

NBS FLAMMABLE ACCELERANTS CONSENSUS GUIDELINES

The National Bureau of Standards is currently working with the Bureau of Alcohol, Tobacco and Firearms, the Federal Bureau of Investigation, and a number of forensic science laboratories on a consensus standard that will help chemists identify flammable accelerants in fire debris. A first interlaboratory evaluation has been completed. NBS will now be contacting all known forensic laboratories in the United States to determine the methods used for the recovery of arson accelerants. Several laboratories will be selected to participate in a second interlaboratory program. The goals of the project are to improve the accuracy of laboratory analysis, expedite arson investigations, and to establish guidelines that will permit laboratory personnel to gain credibility in court.

NATIONAL BUREAU OF STANDARDS LAW ENFORCEMENT STANDARDS PUBLICATIONS

The following publications are of potential interest to criminalists. They are available from the National Bureau of Standards. Single copies may be obtained by writing: The Law Enforcement Standards Laboratory, National Bureau of Standards, Washington, D.C. 20234.

NILECJ-STD-0604.00 - December 1978 - Chemical Spot Test Kits for Preliminary Identification of Drugs of Abuse (GPO: Stock number 027-000-00730-9, price \$1.10).

NIJ-STD-0605.00 - July 1981 - Color Test Reagents/Kits for Preliminary Identification of Drugs of Abuse (GPO: Stock number 027-000-01116-1, price \$2.00).

LESP-RPT-0601.00 - February 1977 - Standard Reference Collection of Forensic Science Materials: Status and Needs (GPO: Stock number 027-000-00444-0, price \$1.55).

LESP-RPT-0603.00 - March 1977 - Tests of Hand Held Metal Weapon Detectors (GPO: Stock number 027-000-00454-7, price 35 cents).

NBS Special Publication 480-17 - February 1978 - Auto Headlight Glass: Visible Features of Forensic Utility. (GPO: Stock number 003-003-01857-1, price \$3.00).

NBS Special Publication #480-20 - March 1978 - Directory of Law Enforcement & Criminal Justice Associations and Research Centers - (GPO: Stock number 003-003-01904-6, price \$2.20).

NBS Special Publication #480-21 - May 1977 - The Hazard of Benzidine to Criminal Justice Personnel. (GPO: Stock number 003-003-01777-9, price \$1.00).

NBS Special Publication #480-23 - August 1980 - Selection and Application Guide to Police Photographic Equipment. (GPO: Stock number 003-003-02224-1, price \$3.75).

NBS Special Publication #480-40 - December 1981 - Paint Solubility Testing. (No price or GPO number available).

NBS Special Publication #480-41 - July 1981 - Breath Alcohol Sampling Simulator (BASS) for Qualification Testing of Breath Alcohol Measurement Devices - (GPO: Stock number 003-003-02336-1, price \$2.50).

NBS Special Publication #480-43 - October 1981 - Hydrocarbon Vapor Standards for Performance Evaluation of Combustible Gas Detectors. (GPO: Stock number 003-003-02371-0, price \$2.00).

NBSIR 81-2286 - October 1981 - The Characterization of Auto Headlight Glass by Refractive Index and Density. No GPO number available.

NBS Special Publication #260 - NBS Standard Reference Materials Catalog, 1979-80 Edition.

EMPLOYMENT OPPORTUNITIES

CRIMINALIST - Ventura County Laboratory

Requires graduation from an accredited college or university with a major in criminalistics, biochemistry, toxicology, or other relevant physical/biological science. Up to two positions expected to become available during late summer 1982. Major areas of work will be (1) Toxicology and (2) General Criminalistics (separate positions). Contact or send resume to Dr. A.K. Bergh, Director, Ventura County Crime Laboratory, 800 South Victoria Avenue, Ventura, CA 93009. Telephone: (805) 654-2332.

CRIMINALIST I and II - Los Angeles County Sheriff's Office Laboratory

The Criminalist I position requires a minimum of a bachelor's degree in criminalistics, chemistry, biochemistry, or a closely related scientific field including at least eight semester hours of general chemistry and three semester hours of quantitative analysis. The Criminalist II position requires the above academic qualifications and two years professional forensic science laboratory experience. A master's degree in criminalistics, chemistry, biochemistry, or a closely related field may be substituted for one year of experience. Contact Barry A.J. Fisher, Chief, Sheriff's Criminalistics Laboratory, 2020 West Beverly Blvd., Los Angeles, CA 90057, phone: 213-974-4673.

CRIMINALIST - El Cajon Police Laboratory

Requires bachelor's degree in criminalistics or related field and 3-4 years experience. Possession of or ability to obtain Forensic Alcohol Analyst certification is a special requirement. Contact Personnel Dept., City of Cajon, 200 E. Main St., El Cajon, CA 92020, (714) 440-1776.

CRIME LABORATORY ANALYST - South Dakota

Contact Ilya Zeldes, Division of Crime Investigation, Criminal Justice Training Center, East Highway 34, Pierre, South Dakota 57501.

DRUG CHEMIST SUPERVISOR - Virginia

Contact Charles Killion, Bureau of Forensic Sciences, P.O. Box 486, Merrifield, VA 22116, phone: 703-573-8638.

FIREARMS EXAMINER, TRACE EVIDENCE ANALYST - Broward County Sheriff's Lab, Florida

Both positions require bachelor's degree and 3 years relevant experience. Contact Personnel Division, Broward County Sheriff's Dept., P.O. Box 9507, Ft. Lauderdale, FL 33310.

CLOSURE OF THE FOUNTAIN VALLEY CRIME LABORATORY

Due to budget cuts, the Fountain Valley City Council has ordered closure of their Crime Laboratory. Edwin Jones, the Fountain Valley criminalist, has been laid off and is looking for a new position. Fountain Valley cases will now be sent to the Orange County lab. Edwin's current address is 9181 Coronet Ave., Westminster, CA 92683. He may be reached at (714) 894-7840.

ASCLD OPERATIONS AND PROGRAM COMMITTEE

An Operations and Program Committee has recently been formed by the American Society of Crime Lab Director s (ASCLD). The goals of the committee are:

1. To assess the needs of the Nation's forensic science community in the areas of training and research.
2. To assist the FBI in coordinating the activities of the Forensic Science Research and Training Center at Quantico, Virginia (FSRTC) and to make recommendations as necessary to ensure that the FSRTC is responsive to the needs of the Nation's forensic science community.
3. To assure the widest possible dissemination of information developed from the activities conducted at the FSRTC.

Specific sub-committee assignments include:

1. Providing a list of reference materials invaluable to the research efforts in forensic science.
2. Suggesting methods for communicating research ideas and information into and out of FSRTC.
3. Establishing a recommendation as to what resource allocations should be provided for research at FSRTC.
4. Identifying the types of reference collections that might be of value and how to establish these.
5. Developing a peer review concept for assessing proposed research coming to FSRTC from the forensic science community.
6. Looking at the student selection criteria for course attendance at FSRTC.
7. Identifying types of specialized road schools which could be taught and how they could be administered.
8. Identifying what types of specialized symposia would best be offered at the FSRTC and how they could be presented.
9. Assessment of the training needs of the forensic science community.

The committee intends to rely heavily on input from the regional associations. Committee members are:

| | |
|----------------------|---|
| John F. Anderson | Eastern Washington State Crime Laboratory |
| Dr. Robert C. Briner | Southeast Missouri Crime Laboratory |
| Dr. James Buttram | Alabama State Department of Forensic Science |
| Timothy R. Dixon | Illinois Bureau of Scientific Services |
| Barry A. J. Fisher | Los Angeles, California, Crime Laboratory |
| Howard Harris | New York City Police Department Crime Lab |
| Thomas M. Muller | Baltimore, Maryland, Police Department |
| Andrew H. Principe | North Illinois Police Crime Laboratory |
| William Doran | Deputy Assistant, Lab Division, Washington, D.C. |
| Eugene Rieder | Unit Chief, Forensic Science Research Center, Quantico, Virginia |
| Cecil Yates | Unit Chief, Forensic Training Unit, Quantico, Virginia |
| Jim Kearney | Quantico, Virginia |
| Willard C. Stuver | American Academy of Forensic Science, Dade County, Florida |
| James S. Bell, M.D. | National Association of Medical Examiners, UTCHS Memphis |
| Dr. Ralph O. Allen | University of Virginia |

ETHICAL DILEMMA

By Peter D. Barnett
Forensic Science Assoc.

A recurring theme which is present in many of the situations when criminalists are faced with ethical dilemmas revolves around the problems of discovery: Who is entitled to what information or evidence, and when are they entitled to receive it? The laws of discovery place certain requirements on District Attorneys, law enforcement officers, defense counsel, and other individuals to turn over information that they have to interested parties. What information needs to be provided to who, when that information needs to be provided, and whether or not the information has to be volunteered depends on who has the information, the nature of the information, and one's interpretation of the ever changing law in this area (for a discussion of the law in this area see the article by Parker Bell in the September 1980 CAC Newsletter). The typical response of a criminalist when faced with a question of whether or not to divulge information is, "Let the lawyers decide." I would propose that criminalists need not always defer to lawyers in making decisions of this type, but that criminalists need to evaluate the pros and cons of the various approaches to discovery and have significant say in when such discovery will be permitted or required.

The following case presents an interesting discovery question and one which is probably not amenable to easy resolution under existing law.

A defendant is charged with assault with a caustic substance in that he allegedly purchased a bottle of acid, altered the top of the bottle, and threw it at the victim intending for the acid to splash from the bottle onto the victim. In fact, the bottle was thrown at the victim and acid did get on the victim causing serious injuries. The police were called to the crime scene, conducted minimal investigation, arrested the defendant and turned the case over to the District Attorney's office for prosecution.

The defendant claimed that he had been talking with the victim after a trip to the hardware store to buy the bottle of acid which he was going to use for maintenance in his apartment. The victim, according to the defendant, assaulted the defendant and he reflexively threw what he had in his hand, the acid bottle, toward the victim. The bottle struck the wall causing the cap to break and acid to splash on the victim. Hence, the defense attorney could argue that there was no intention to throw acid at the victim, and that, at most, the defendant could be guilty only of an assault.

Several weeks after informing the District Attorney's office that she intended to have someone take a look at the crime scene, the defense attorney hired a consulting criminalist to accompany her and the defendant to the crime scene. During the examination at the scene, an acid bottle was found in a closet, where it appeared to have been since the day of the incident. The acid bottle was seized by the defense consultant for preservation and laboratory examination.

At trial, the acid bottle was produced by the defense consultant who testified that the bottle appeared to have been broken as a result of having been thrown and did not appear to have been intentionally altered. The District Attorney vigorously objected to the presentation of the bottle claiming that he should have been advised of its existence and that failure to do so was misconduct on the part of the attorney and perhaps suppression of evidence on the part of the defense consultant.

The two basic issues to be resolved in this type of case are the necessity of making judgements based on all pertinent evidence versus the necessity of allowing the defendant to vigorously investigate the circumstances surrounding the offense he is charged without fear that such investigation can be used against him. Obviously, everybody would like to make decisions based on all pertinent information. On the other hand, if defendants knew that the results of any investigations they made on their own behalf could be used against them, they would be hesitant to undertake such investigations for fear of the outcome.

In the case described above, since the District Attorney had ample opportunity to inspect the crime scene and find the evidence, and since he was told that the defense investigator was going to the crime scene, the defense consultant felt that it was proper to seize the evidence that he found and that he was under no obligation to turn the evidence over to the District Attorney. Was this the proper course of action, or did the defense consultant have an obligation to turn the evidence over to the District Attorney prior to trial? If for some reason the defense consultant did not testify and present the evidence, would he have been obligated to turn it over to the District Attorney?

The responses to the June Ethical Dilemma were numerous and contained a number of interesting comments. Most of the respondents indicated that they felt the prosecution consultant was correct in not mentioning his agreement with the defense consultant's analysis unless he was asked directly. Several people agreed with Ray Davis who said "(the) prosecution consultant should only mention his agreement if asked for it directly." One anonymous respondent put it slightly more colorfully: "If he told everybody and their dogs what he found, I don't think you can expect him

to do a tap dance in court too..." One interesting, but anonymous, response was,

"I've heard too many criminalists brag about how they have slipped unsolicited information into their testimony in an effort to force the course of justice to their own myopic view. They have little or no understanding of the philosophy of our criminal justice system and don't particularly care to learn. They only know what they want and will be unresponsive to questions asked in order to achieve their ends: Most of this is done in a condition of ignorance and self aggrandizement. Nevertheless, it is unprofessional and unethical".

Arne Bergh's comment was that if the prosecution consultant really felt that the examination of biological evidence in sexual assault cases is unreliable, and if he was given no opportunity to discuss his examinations from the witness stand, he was correct in not doing so. However, if he felt that such examinations were reliable, his failure to discuss his results would be a violation of Section 3 G of the Code of Ethics.

Two respondents felt that the prosecution consultant did violate the Code of Ethics. Keith Peterson-Inman responded,

"It appears as though there must have been collusion between the prosecutor and his consulting criminalist... If there was prior agreement to not discuss the prosecuting expert's analysis, I would say that the criminalist has actually violated Section 3 H... While it is hard to read into the mind of the prosecutor's expert, it seems that his testimony is a tactic of the prosecutor and, if he knows of the tactic, to participate would be a violation of the Code. The false impression planted in the mind of the jury in this case is that the expert feels that there is a problem with the defense expert's analysis and that he (the prosecutor's expert) does not agree with the defense expert's opinion."

Robert Ogle cites the section of the preamble of the Code of Ethics which states "these findings of facts and his opinion and conclusions should then be reported, with all of the accuracy and skill of which the criminalist is capable, to the end that all may fully understand and be able to place the findings in their proper relationship to the problem at issue". Ogle continues, "the problem at issue is clearly the guilt

or innocence of the defendant and therefore if the innocence of the defendant is known to the criminalist testifying for the prosecutor and this information is not brought to the attention of the court, the criminalist is guilty of the most egregious conduct possible other than the deliberate manufacture of evidence." Ogle also cites Section 3 G of the Code of Ethics which says "It is not the object of the criminalist's appearance in court to present only that evidence which supports the view of the side which employs him. He has a moral obligation to see to it that the court understands the evidence as it exists and to present it in an impartial manner". Ogle concludes, "The facts of the case you describe is the clearest violation of this section possible. One cannot knowingly withhold evidence of innocence and not be in violation of this section."

RESPONSES TO THE SEPTEMBER ETHICAL DILEMMA

- ☐ The defense consultant was not obligated to turn over the evidence to the D. A.
- ☐ It was a violation of Section _____ of the CAC Code of Ethics to not turn the evidence over to the D. A. prior to trial.
- ☐ If the defense consultant had not presented the evidence at trial he would have been obligated to turn it over to the D. A.

Comments:

Return To: Peter D. Barnett
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COMMENTS ON THE MARCH AND JUNE 1982 ETHICAL DILEMMAS

David A. Stoney
 University of California, Berkeley, and the
 Institute of Forensic Science Criminalistics Laboratory

The ethical dilemmas presented in the March and June Newsletters focus on sections III. G. and III. H. of the CAC Code of Ethics. From the description of the response to the March dilemma, and the questions presented in the June dilemma, it is apparent that there are diverging views concerning the intent of these two Code sections. I believe this divergence results from different perceptions of the role of expert testimony in the criminal justice system. When viewed from these different perspectives there are some ambiguities in the Code.

The Code sections at issue are as follows:

III. G. It is not the object of the criminalist's appearance in court to present only that evidence which supports the view of the side which employs him. He has a moral obligation to see to it that the court understands the evidence as it exists and to present it in an impartial manner.

III. H. The criminalist will not by implication, knowingly or intentionally, assist the contestants in a case through such tactics as will implant a false impression in the minds of the jury.

Critical to our perceptions of the Code's meaning are: (1) In Section III. H. what we view as possible "false impressions" that might be given to the trier of fact and (2) in Section III. G. the scope of the word "evidence."

I. Section III. H. and False Impressions

In my view the "false impressions" at issue would arise through deceptive presentation of either a scientific test result or a scientific opinion. Some individual test results might be presented by themselves without affecting their scientific validity; others might require the context of related tests to prevent a false impression from being conveyed.

A different, overall, "false impression" that a trier of fact might reach is an erroneous finding of guilt or innocence. We must be wary of our use of "erroneous finding," for it is, of course, the jury which determines guilt or innocence. What we are concerned with is that a criminalist might have contributed scientific evidence which gives a false impression of guilt or innocence. If, however, an individual scientific test or opinion is presented accurately and properly qualified, how could we determine that this contributes to a "false impression?" Without depending on our own prior assessment of guilt or innocence we could not do so. Would we say that if a preponderance of scientific evidence points one way, it is unethical to present valid scientific evidence which points the other? Such a view runs contrary to basic legal principles, and we must conclude that the "false impressions" which are referred to are impressions about scientific tests or opinions, as opposed to guilt or innocence. To be sure, if only on side of a scientific issue is presented, then a false impression of the evidential significance could well result. This issue is directly considered in Section III. G. of the Code of Ethics.

II. Section III. G. and the Scope of the Word: Evidence.

As used in Section III. G. does the word "evidence" mean "the evidence the criminalist is giving," i.e., his testimony, or does it mean "the physical evidence," all the relevant evidence the criminalist has seen? This is an important distinction. In either case there is an obligation to ensure that

the meaning of any testimony is understood and that it be presented in an impartial manner. This will occasionally require that the criminalist give an extended explanation of a scientific issue, even when uninvited to do so. Suppose, however, that fully informed attorneys from both sides in a case do not ask questions concerning some of the physical evidence which the criminalist feels is relevant. It is not that any of his testimony might be misinterpreted, but rather that not all issues the criminalist feels are relevant have been touched upon. If we accept that "evidence" means testimony, then there is no dilemma. The attorneys were simply not interested in the other issues, and that is that. If, however, "evidence" means all the relevant physical evidence, then the criminalist is ethically obligated to introduce any undiscussed physical evidence which he judges to be relevant. This second view is in clear conflict with the role of the expert witness in the legal system because it places the criminalist in judgement of what evidence ought to be presented. Any criminalist who has tried to interject additional issues during testimony knows how coolly he is received. The practice obviously rubs the legal system the wrong way. We must conclude that the word "evidence" as used in this code section means testimonial evidence. What is critical is that the jury understands what the criminalist believes regarding the evidence he is giving.

III. Prosecution and Defense Experts

The role of the expert in the criminal justice system is of central importance to our interpretation of the Code of Ethics. The remainder of this paper presents my responses to the March and June ethical dilemmas and a general discussion of the expert's role. It is useful at this point to pause and briefly contrast the roles of the prosecution and defense experts. What differences exist are derived from legal requirements, not scientific or ethical differences. In both roles the expert has a "client," in both there is a consideration of physical evidence, and in both the expert conveys the meaning of the physical evidence to the client. Most critically, should testimony result, the requirements of the expert are equivalent.

The roles of the prosecution and defense experts nevertheless do differ because of one fundamental legal principle: the prosecution has the burden of proof. A corollary is that a defendant (defense attorney) has a right to examine the evidence against him without risk of self-incrimination. We are all familiar with these words. Their effect is that while both prosecution and defense experts provide scientific information to the legal system, the way in which the legal system uses this information differs. The legal differences, in turn, reach to some degree into the laboratory and affect decisions and procedures the expert must follow in his examination. Many of the ethical dilemmas we have considered in the Newsletter over the last few years have focused on these differences. It is important to understand that the differences result from legal requirements and pertain to constraints put upon how information is used; there is no difference in the requirements for scientific rigor or impartial testimony.

IV. The March 1982 Ethical Dilemma.

The March ethical dilemma presented a case where a criminalist consulting for a defense attorney re-analyzed a number of items in a case, finding some errors in work originally done, but also uncovering additional evidence which was incriminating to the accused. This criminalist advised the defense attorney to have a second criminalist re-analyze selected items of the evidence, allowing the evidence favorable to the accused to be presented without risk of revealing

additional incriminating evidence. The question is whether section III. H. of the Code of Ethics has been violated.

I do not believe the first criminalist violates the Code of Ethics. The first criminalist has performed a broad examination on many articles of evidence. Whether taken collectively or individually, the presentation of any of the examination results would not present a false impression, of those results, to the jury. In this instance, however, the first criminalist is not presenting any results, but rather advising the defending attorney.

Advice given to a defense attorney takes two general forms. The first and fundamental form is helping the attorney understand the significance of the evidence. A second form includes helping him assess whether it would be useful to use defense expert testimony or, alternatively, to focus on cross-examination of the prosecution's expert. The latter form of advice is, in effect, advising the attorney on trial tactics. This may include the recommendation not to use information developed through re-analysis of evidence. It is the defense attorney's legal duty to present the best argument for the defendant. An argument might be made that this duty is an attempt to plant a false impression in the mind of the juror, and that by extension the criminalist aiding in such a process is acting unethically. This is ridiculous. Advice to an attorney as to how to proceed with a case cannot, in itself, be considered as a process by which a criminalist implants a false impression in the minds of the jury. The action of the attorney is necessarily intermediate, and the attorney is acting in a role specifically proscribed by law.

I do not believe the second criminalist violates any ethical provision, even if there is knowledge of the events prior to his retention. The selection of what items to re-examine is one made by the defense attorney, often after consultation with the criminalist. Whether working for the prosecution or defense there is always a selection of the evidence to be examined. It begins at the crime scene and extends through the entire examination: the potential evidential value is weighed against the practical constraints of time and cost. If items of evidence are reasonably discrete, analysis and testimony relating to selected items will not present a false impression of the significance of the scientific results.

Quite a different situation exists where the selection itself introduces a bias to the results or a biased interpretation of the individual test result. Clearly bias is introduced if, for example, only selected portions of blood spatter evidence at a scene are considered and a general reconstruction is provided. A criminalist is under an obligation to consider fully the evidence surrounding any particular test or interpretation of a test result. If a criminalist suspects that there has been a deceptive screening of the evidence which would affect the validity of the tests, there is an obligation to correct the situation and it would be an ethical violation to proceed. I see no ethical aspects to the second criminalist's position other than those which exist when performing any evidential examination.

V. The June 1982 Ethical Dilemma.

The June ethical dilemma presented a case where the evidence had been analyzed by three laboratories. The original examiner found that the evidence in several sexual assault cases was consistent with the assaults being committed by the defendant. A second analysis, performed by a defense consultant, gave findings in several of the cases of either (1) antigens foreign to both the victim and the defendant or (2) the absence of antigens which would be expected given the amount of semen present, if the defendant were the semen donor. An interpretation was given by the second laboratory that the evidence did not support the charges against the defendant. A third laboratory, examining the

evidence at the request of the prosecution, effectively duplicated the results of the second laboratory, and gave a similar interpretation. Both the prosecution and defense attorneys were informed of the findings and interpretations of all three laboratories.

At trial the defense consultant gives an opinion that the evidence does not support the allegations. The prosecution consultant testifies, but is not asked any questions by either prosecution or defense concerning his examination of the evidence. Testimony is confined to general issues. The question is whether section III. G. of the Code of Ethics has been violated by the failure of the criminalist to somehow introduce testimony concerning his analysis.

According to my interpretation of section III. G., there is no issue. The attorneys were not interested in presenting the test results of the prosecution consultant. In as much as the testimony given was an honest assessment of the general issues, there is no preferential presentation of evidence supporting only one side.

VI. Discussion

I recently gave evidence in a case which bore some similarity to the hypothetical one in the June dilemma. I was in the role of the prosecution consultant. While there were a number of important differences between the facts of that case and the ethical dilemma, the basic ethical issue is much simpler than the circumstances of either case. Basically the question is: if fully informed attorneys do not choose to present all of what a criminalist feels is relevant evidence, what, if anything, should a criminalist do about it? My response is, in effect, nothing. This response necessarily follows from a consideration of a criminalist's role in the criminal justice system.

It is useful to keep the roles of the trial participants in mind, and to strive to understand the reasons for them. The roles may be concisely defined:

Attorney for prosecution: given probable cause, to present the best argument that the accused committed the offense.

Attorney for defense: to present the best argument that the accused did not commit the offense.

Judge: to rule on issues of law.

Trier of fact: to determine the factual issues of the case and, ultimately, to determine whether guilt has been established beyond reasonable doubt.

Expert witness: to assist the trier of fact to understand evidence when scientific or specialized knowledge is necessary.

In our role as experts we are guests in the courtroom, invited when necessary. Our role is created by the legal system and defined by it. In the September 1980 CAC Newsletter, responding to two of the earliest ethical dilemmas, Parker Bell cautioned:

"But to keep our perspective, we must first define which is the dog and which is the tail, and who is doing the wagging. It cannot be the individual criminalist, nor criminalists acting together, who define 'justice,' if such a definition varies from the definition imposed by the criminal justice system as a whole....The criminalist plays but one role in the whole scenario, and he should be aware of what that role is."

As criminalists we tend to imagine our role as greater than it is, and to wish it was larger. This is an understandable job hazard. From our perspective we have valuable relevant scientific findings to present, carefully considered and accurate. When we feel certain that our science definitively proves guilt or innocence, it is immensely frustrating to observe an inconsistent verdict. As we grind our teeth and curse the injustices, it is helpful to remember why our role is limited.

From our own perspective we may have truth to offer the trier of fact, but in the eyes of the judge and counsel this is preposterous. Truth is the goal of the process, not the offering of science. We have to offer, instead, what we believe to be the truth. Our offering is considered by a process intended to test our reliability and to ensure that the facts are determined by the jury, not by our science. Courts are quite explicit about this role. Moenssens, Moses, and Inbau (1973) give the following example of general jury instructions limiting the import of expert opinion:

"You are instructed that you may consider the testimony of these witnesses and give it such weight and value as you think it should have, but the weight and value to be given their testimony is for you to determine. You are not required to surrender your own judgement to that of any person testifying as an expert, for the testimony of an expert, like that of any other witness, is to be received by you and given such weight and value as you deem it is entitled to receive."

Our opinions are not accepted directly because the legal system does not trust us with this responsibility. We advocate science as a strong and powerful tool, yet science is weak in many ways. It is weak because our theories change, and what today is our best interpretation of the evidence may not survive the test of time. Some of our science is always erroneous, try how we might to prevent it. In a particular case we may or may not see any possibility for it, but the legal system, in a sense, knows better. It has been around a long time, seen what kinds of honest scientific errors can occur, and shielded itself from us. Well, when we're right (and I believe I'm right just as strongly as the next criminalist) this causes awkwardness, inefficiency and, sometimes -- from any reasonable scientific view -- injustice; when we're wrong, justice sits back and smiles and says "That's why I don't trust you guys, even when you're right."

My interpretations of Section III. G. and Section III. H. of the Code follow from an attempt to keep within the role of an expert witness. If Section III. G. of our Code of Ethics includes "false impressions" of guilt or innocence, or if Section III. H. includes as evidence "all the relevant physical evidence the criminalist has seen," then we necessarily place ourselves in a position of judgement. This is not a judgement of scientific issues, but a judgement about what the jury ought to be told and what findings the jury ought to have. It is not our role to decide what evidence is to be presented, that is the lawyer's job. Neither is it our role to determine the factual issues of a case, that is the jury's job. It is our place to act as scientific advisors and to offer scientific evidence, when asked. When we give evidence it is our duty to ensure that it is understood, put in its proper scientific context, and not given false weight.

I am not arguing that as criminalists we should be insensitive to justice, nor that we should refrain from advocating the benefits which science can offer the courts. I do feel we must distinguish between our role as we would idealistically have it, and what it is as determined by the legal system. How the system sees our role should be of great importance to us. If it does not coincide with our ideals or if we perceive injustices, then we have a professional obligation to seek improvement. We must realize, however, that the courts have good reasons for being the way they are. We cannot reasonably achieve changes in the legal system by arrogantly forcing ourselves into a role that is not sanctioned by it. In court we are guests. We should have respect for the invitation and and recognize the limitations of our role.

Reference

Moenssens, A. A., R. E. Moses, and F. E. Inbau. 1973. Scientific Evidence in Criminal Cases. Mineola, New York: The Foundation Press, Inc., p. 26.

ARC VS CHORD LENGTH WHEN MEASURING LAND WIDTHS - A RESPONSE

Frank Cassidy
DOJ - Santa Barbara

This letter is to clarify and comment on Dave Stoney's note, "Arc vs Chord Length When Measuring Land Widths," in the June CAC Newsletter.

I was aware of Jim Brackett's article. When I contacted him several months before the CAC Newport Beach Meeting, he said he would send me a copy if he could find it. I never received it. (I talked with Jim at Newport Beach and he said he had misplaced my note, but he did send a copy afterwards). I was unaware of Mathews' comments.

However, in 1954 when Mathews wrote his critique, there was no GLIS data. In 1982 we do have the GLIS information to aid us in determining the possible make and model of weapons and we in our laboratory do use it.

I may not have made myself clear, when presenting my paper, that I was concerned if firearms examiners were measuring arc lengths in their lab but used the GLIS data (chord length) to determine an unknown weapon.

Stoney states that Mathews accepted ".001 inches as the level of reproducibility..." If the value of .001 inches is acceptable, I would think variations of .006 inches would not be acceptable. However, if one measures the chord length of the land impression in a .45 caliber bullet fired from a Model LM-4 Semmerling (.45 Auto), it is in the order of .186 inches. One can compute that the arc length will then be .192 inches. Therefore, I don't believe one can necessarily state that it makes no difference whether one were to use arc or chord length.

DO YOU DREAM OF LABORATORIES?

The interpretation of this dream is to be found in Ten Thousand Dreams Interpreted or What's in a Dream -- A Scientific and Practical Exposition, by G.H. Miller (Rand McNally, 1931).

"To dream of being in a laboratory denotes great energies wasted in unfruitful enterprises when you might succeed in some more practical business. If you think yourself an alchemist, and try to discover a process to turn other things into gold, you will entertain far-reaching and interesting projects, but you will fail to reach the apex of your ambition. Wealth will prove a myth, and the woman you love will hold a false position toward you."

An Exploration into the Existing Literature
on Microcrystal Test Reagents for Drugs

Hiram K. Evans

Microcrystal tests, as generally used by criminalists, consist of adding a reagent to a sample of unknown, usually a suspected drug, and comparing the resulting crystals with the form and habit of those obtained by similar treatment of a known sample. These tests tend to be isolated trials of reagent and sample and if the expected crystal forms are not obtained, the analyst derives little information on the true identity of the sample and no direction for further testing.

This method ignores those instances when a combination of reagent and sample yield no precipitate or a non-crystalline one and fails to explore the optical properties of crystals which do form, perhaps excepting the existence of birefringence and sign of elongation. More criminalists lately have been educated to the wider applications of chemical microscopy and the techniques of optical crystallography through the efforts of Skip Palenik and Dr. Walter McCrone, but these techniques do not appear often employed with the results of microcrystal tests for drugs.

Those tests in which reagent and drug do yield the expected crystal form cause some consternation, for me at least, in that the exact chemical nature of that crystal remains unknown. This is not to say that the empirical value of the test is diminished, but I believe most of us are sufficiently curious as to be more at ease with a test we can comfortably explain to ourselves and to the ultimate audience for our analyses, judges and juries.

The following list of reagents in order of their sensitivity is presented as one means to diminish the isolation of any particular test by making available at least in a general way, a means of deciding which of the many reagents might be useful once information has been obtained with an initial test, even if that information is in the form of a failure to give results. This list is a compilation and collation of several lists of reagent sensitivities toward specific drugs published during the 1930's by Charles C Fulton (1-3). The precipitating power numbers in the right hand column are based upon the assignment of a value of "1" to that solution of a drug which will just produce a visible precipitate with phosphomolybdic acid, numbers less than 1 indicating greater sensitivity (4). The precipitates produced are not necessarily crystalline.

| <u>Name of Reagent</u> | <u>Precipitating Power</u> |
|---------------------------------|----------------------------|
| Wagner's Reagent # 1 | .125 |
| Wagner's Reagent # 1, acidified | |
| Mercuric iodide in NaBr sol'n. | |
| Bromine in NaBr sol'n. | |
| Bromine in HBr sol'n. | |
| Mayer's Reagent, conc. | .25 |
| Bromine water | |
| Sodium picrate | |
| Wagner's Reagent # 4 | |
| Wagner's Reagent # 3 | |

| | |
|---|-----|
| Dragendorff Reagent | |
| Mayer's Reagent | |
| Platinum sodium thiocyanate | .5 |
| Dragendorff Reagent + KI | |
| Aurobromous acid (HAuBr_4) | |
| Bismuth bromide in HBr sol'n. | .75 |
| Iodine in NaBr sol'n. | |
| Wagner's Reagent # 3, acidified | |
| Aurobromous acid in HCl sol'n. | |
| Mercuric iodide in HBr sol'n. | |
| Aurochlorous acid (HAuCl_4) | |
| Phosphomolybdic acid | 1 |
| Silicotungstic acid | |
| Phosphotungstic acid | |
| Wagner's Reagent # 5 | |
| Mayer's Reagent, acidified | |
| Palladium sodium iodide | |
| Mercuric sodium bromide | 2 |
| Platinic iodide in excess NaBr sol'n. | |
| Iodine in excess NaBr sol'n. | 3 |
| Wagner's Reagent # 8 | |
| Antimony potassium iodide, acidified | |
| Mayer's Reagent + KI | |
| Wagner's Reagent # 7 | |
| Marme's Reagent | |
| Tannic acid + sodium acetate | |
| Mercuric iodide in excess NaBr sol'n. | |
| Wagner's Reagent # 6 | |
| Bromomercuric acid | 6 |
| Cadmium iodide | |
| Wagner's Reagent # 5, acidified | |
| Picric acid | |
| Mercuric potassium iodide | |
| Reinecke's salt | 7 |
| Silver sodium iodide | |
| Ammonium molybdate | |
| Platinum bromide in HCl sol'n. | |
| Aurochlorous acid in H_2SO_4 sol'n. | |
| Stannous sodium iodide | |
| Nessler's Reagent | |
| Mercuric sodium chloride | 15 |
| Chromic anhydride, acidified | |
| Mercuric bromide in NaBr sol'n. | 20 |
| Mercuric bromide | |
| Cobalt sodium thiocyanate | |
| Palladium chloride | |
| Trinitroresorcin | |
| Chromic anhydride in NaCl sol'n. | |
| Wagner's Reagent # 8, acidified | |
| Cadmium sodium bromide | |
| Cadmium sodium thiocyanate | 25 |
| Cadmium sodium thiocyanate, acidified | |
| Platinum cyanide | |
| Sodium phosphomolybdic acid | |
| Mercuric iodide in HCl sol'n. | |
| Mercuric sodium chloronitrite | |

| | |
|--|-----|
| Gold cyanide | |
| Potassium permanganate | |
| Sodium carbonate | |
| Sodium hydroxide | 35 |
| Ammonium hydroxide | |
| Chromic anhydride in HCl sol'n. | |
| Mercuric chloride | |
| Platinum bromide | |
| Silver sodium iodide, acidified | |
| Borax | 40 |
| Sodium phosphate | |
| Ferrous thiocyanate | |
| Chloromercuric acid | |
| Mercuric chloride in NaCl sol'n. | |
| Alizarin sodium sulfonate | 50 |
| Potassium cyanide | |
| Platinum chloride | |
| Manganese sodium thiocyanate | |
| Stannous sodium thiocyanate | 80 |
| Sodium nitroprusside | |
| Zinc potassium iodide | 100 |
| Nickel sodium thiocyanate | |
| Potassium dichromate | |
| Mayer's Reagent, acidified + KI | |
| Mercuric sodium nitrite | 150 |
| Ammonium thiocyanate | |
| Sodium thiocyanate | |
| Potassium ferricyanide | |
| Chromic anhydride | |
| Aurochlorous acid (HAuCl_4) in HCl sol'n. | |
| Ferris chloride, conc. | 200 |
| Potassium iodide, conc. | |
| Marme's Reagent | |
| Stannous sodium bromide | |
| Mercuric bromide in HCl sol'n. | |
| Mercuric chloride in HCl sol'n. | 350 |
| Sodium cobaltinitrite | |
| Antimony trichloride | |
| Tannic acid | |
| Ferrous chloride in HCl sol'n. | |
| Stannous chloride in HCl sol'n. | |
| Stannic chloride in HCl sol'n. | |
| Bismuth chloride in HCl sol'n. | |
| Perchloric acid | |
| Zinc chloride | |
| Mercuric bromide in H_2SO_4 | 400 |
| Potassium chromate | |
| Cadmium chloride | |
| Cadmium chloride in HCl sol'n. | |
| Palladium cupric sodium nitrite | |
| Palladium sodium nitrite | |
| Picrolonic acid | |
| Potassium iodide, 5% w:v | |
| Potassium ferrocyanide | |
| Potassium acetate | |
| Saccharin | |
| Sodium hydrogen phosphate | |

As you may have noted, about 75% of the reagents listed above consist of a metal ion and a halide ion. Experimental work in the 1940's indicated amines combine with metallic ions and halides to form compounds of the general formulae



Direct experiments were performed with mercury, cadmium, bismuth, antimony, tin, gold, platinum, and palladium (5-7), but from their location in the periodic table and reagent formulation, similar compounds appear likely with molybdenum, chromium, manganese, iron, cobalt, nickel, copper, and zinc as well. Most work has been done using chloride and bromide ions, but iodide appears equally likely to form similar compounds for the reasons cited above. It also appears the lower positions of the periodic chart tend toward lower solubility of the formed compounds, though not necessarily yielding crystalline precipitates. Silver halides are generally too insoluble for use as reagents for amines.

| 6b | 7b | | 8 | | 1b | 2b |
|----|----|----|----|----|----|----|
| Cr | Mn | Fe | Co | Ni | Cu | Zn |
| Mo | | | | Pd | Ag | Cd |
| W | | | | Pt | Au | Hg |

References

1. Fulton CC. Identification of cocaine and novocaine. American Journal of Pharmacy 1933; 105:326-339.
2. Fulton CC. Identification of cocaine and novocaine. American Journal of Pharmacy 1933; 105:374-379.
3. Fulton CC. The microscopic identification of heroine. American Journal of Pharmacy 1933; 105:436-440.
4. Fulton CC. Alkaloids and their reagents. American Journal of Pharmacy 1939; 111:184-192.
5. White EP. Salts of alkaloids with bromo complexes of some heavy metals. Journal of the American Pharmaceutical Association, Scientific Edition 1941; 30:156-161.
6. White EP. Bromo complexes for the identification of metals and alkaloids. Industrial and Engineering Chemistry, Analytical Edition 1941; 13:509-511.
7. Fulton CC. Relation of alkaloidal chemistry to inorganic, and the use of bromauric acid as a reagent for inorganic micro-crystal tests. Journal of the American Pharmaceutical Association, Scientific Edition 1942; 31:177-182.

ADA/AK Electrophoresis on Agarose Gel

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(Reprinted from DOJ TIELINE
by permission)

The following describes a modification of Brian Wraxall's Group II system by which the ADA and AK polymorphisms may be phenotyped in fresh blood and bloodstains in 90 minutes of electrophoresis using an agarose gel as the support media.

Besides allowing more samples to be analyzed in less time, it has been found that the bands are much tighter. The AK migrates fully off the origin toward the cathode reducing the possibility of confusing some of the rare phenotypes.

PROCEDURE

1% agarose gel (Seakem Type LE) 1mm thick on a plate measuring 15x20 cm or 20x20 cm.

Buffers were prepared according to Wraxall's Group II procedures.

ELECTROPHORESIS

Lysates are diluted 2:1 with 0.05M Cleland's reagent, while stains are soaked or extracted in a minimal amount of the same reagent. Mercaptoethanol may also be used. See comments below.

The blood samples are applied on thread or fabric swatches, to slots cut in the gel at mid-point on the plate.

Electrophoresis is conducted at 350V for 90 minutes with an initial current of approximately 35 - 40 mA. The wick gap is approximately 13 cm. The AK isozymes migrate cathodally while the ADA isozymes migrate anodally from the origin.

Upon completion of electrophoresis, 10 gm of 1% agarose is heated to boiling for each system and cooled to 55° C. These are then combined with the respective reaction mixtures. The AK mixture is spread from the origin to the hemoglobins. The ADA mixture is spread from the origin to the wick. Development of the AK begins almost immediately while the ADA can take up to 90 minutes to develop fully.

COMMENTS

EAP was evaluated with the system; however, the results were not of the quality obtained with the overnight starch procedure.

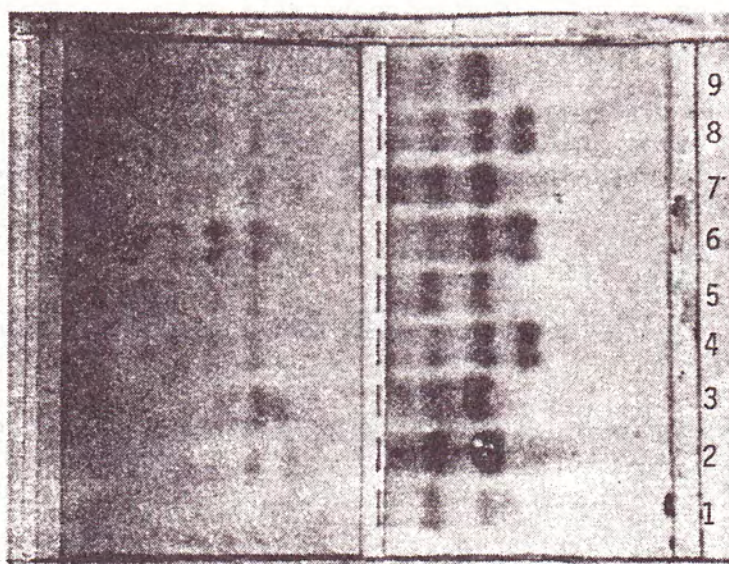
When this procedure was performed in Salinas, for an as yet unknown cause, Cleland's reagent can produce extraneous bands in the AK diagnostic region. This was not found to occur with mercaptoethanol, nor was it found to occur in Fresno or Modesto.

The following photograph illustrates typical results obtained with the procedure described.

+

ADA

AK

ADAAK

9

1

1

8

1

2-1

7

2-1

1

6

1

2-1

5

1

1

4

1

2-1

3

1

1

2

2-1

1

1

1

1

SPERMICIDAL PROPERTIES OF TOOTHPASTE AND COLD CREAM

by

George F. Levine
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 (Reprinted from DOJ TIELINE)

We had an unusual technical problem with an intruder rape case. The victim was awakened in her bed by a gloved, masked intruder who would not allow her to turn on the room lights. She asked if he would allow her to insert her diaphragm and he consented. In the dark, she apparently grabbed the wrong tube, and instead of spermaticidal cream or jelly, used Pepsodent toothpaste. The suspect had difficulty making penetration so he lubricated himself with "Vidal Sassoon Treatment Cleansing Emulsion", a brand of cold cream (the victim's, not something he carried with him - not to make any inferences of its popularity among rapists).

Vaginal swabs, and aspirate tested very strongly for semen by dye tests and gave very strong choline crystal test reactions. No sperm cells could be found on vaginal slides and smears made in the laboratory.

The victim is an A non secretor, PGM 2 1. The vaginal materials tested strongly as O secretor, PGM 1-1.

It was deduced that the suspect may not have had a vasectomy or natural sterility. Toothpastes and other biological cleansers often contain non-ionic detergents (see below). Some of these detergents attack and solubilize some types of cell membranes and are useful for lysing cells in some types of research. Our apparently missing sperm cells may have fallen victim to this type of chemical warfare.

The following test approach was taken with the technical assistance of Mr. Richard French, M.S., a clinical microbiologist with a local medical laboratory corporation.

Stock Solutions:

| | |
|-------------|---|
| Cold Cream | 1 ml + 1 ml saline |
| Toothpaste | 1 ml + 1 ml saline |
| Fresh Semen | 1 ml + 1 ml saline (allowed to liquify) |

Controls:

100 μ l semen stock + 100 μ l saline
 500 μ l semen stock + 10 μ l saline

Test Solutions:

A. 10 μ l T.P. + 500 μ l semen
 B. 100 μ l T.P. + 100 μ l semen

Test Solutions Cont'd.:

- C. 10 μ l C.C. + 500 μ l semen
- D. 100 μ l C.C. + 100 μ l semen
- AC. 10 μ l A + 10 μ l C
- AD. 10 μ l A + 10 μ l D
- BC. 10 μ l B + 10 μ l C
- BD. 10 μ l B + 10 μ l D

Solutions were allowed to incubate two hours (consistent with the approximate time interval of sexual assault and sample collection at the hospital). Only a few grim and ragged looking sperm cells, (123), were found in solution A. Two sperm cells were found in solution B. Lots of intact sperm cells were found in solution C. Three sperm cells were found in solution D. No sperm at all were found in the mixtures AC, AD, BC, and BD. The sperm cells observed disintegrated more or less evenly over their entire surfaces rather than breaking up.

This case illustrates a phenomenon that may occur generally in cases involving cosmetic preparations used as sexual lubricants. Most cosmetic preparations contain some sort of active ingredients; these may or may not be listed on the container. Almost all formulations, even the most exotic, esoteric, or extravagant, contain varying proportions of the same emulsifiers, emollients, detergents, or anionic surfactants. A good reference is Kleason's Clinical Toxicology of Commercial Products, 3rd edition, section 2 - specific ingredients, section 5 - p.518, and section 6 - pp.80-88 and 129.

FINAL NOTE: Criminalists and others interested in saving money on spermaticidal products, or caught unprepared by opportunity might be reminded that toothpastes contain minute abrasives which may or may not be pleasurable but must certainly be wearing. The permeability of vaginal membranes to many substances (alcohol, cocaine, heroin) must also be respected.