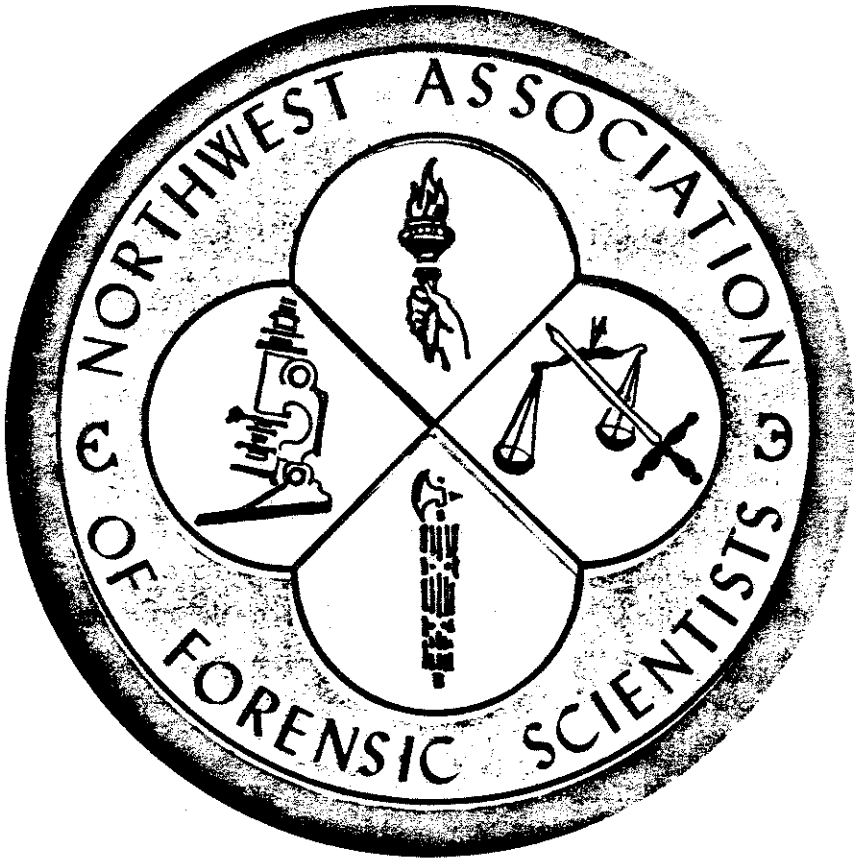
THE NEWSLETTER of



Sept. 1985 Vol II No 3

NORTHWEST ASSOCIATION OF FORENSIC SCIENTISTS

Executive Committee

President	Richard Brooke
President Elect	Wally Baker
Secretary-Treasurer	Lionel Tucker
Executive Committee Member-at-Large	Beth Carpenter
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Committees

Membership	Robert Sager
Publication	George Matsuda
Historical	Brad Telyea
Technical Advancement	Mike Grubb
Continuing Education	Beth Carpenter

UPCOMING MEETING

Fall 1985

October 2, 3 and 4, 1985

Holiday Inn Crowne Plaza
Seattle, Washington

Contact:

Kay Sweeney
Washington State Patrol
Seattle Crime Laboratory
Public Safety Building
Seattle, Washington 98104
(206) 464-7073

STATE OF IDAHO
DEPARTMENT OF HEALTH AND WELFARE
BUREAU OF LABORATORIES, 2220 Old Penitentiary Road, Boise, ID 83702
FORENSIC SECTION (208) 334-2231

It appears that there will be vacancies on three standing committees at the conclusion of the Seattle meeting. Since I will have the dubious honor of appointing the chairpersons for these committees, I would urge any member interested in heading a committee to contact me before or during the meeting. The committees and the current chairpersons are as follows:

Publications - George Matsuda
Technical Advancement - Mike Grubb
Continuing Education - Beth Carpenter

If you have any questions regarding the responsibilities of each of these chairpersons, don't call me because I haven't the foggiest idea. I would suggest that you contact the respective chairperson instead.

See you in Seattle!

Wally Baker

AUTOMATED GEOMETRIC INTERPRETATION OF HUMAN BLOODSTAIN EVIDENCE

Geometric interpretation of human bloodstain evidence has been the subject of much investigation and experimentation.[1] Of particular interest to those charged with crime scene reconstruction has been the development of empirical formulae relating a bloodstain's width, length and orientation to its point of origin. Using methods described by MacDonell[2], MacDonell and Bialousz[3], De Forest et al[4], and Balthazard et al[5], a computer program has been developed which greatly simplifies the data handling and computations necessary to apply the formulae. Further, this program can be used to represent schematically the position of a victim in a room at the instant of bloodshed, thus making the task of stringing the angle of impact unnecessary.

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[1]Work was first presented in 1939 with Balthazard's study of the influence of trajectory on resulting bloodstain shape. See later citation.

[2]MacDonell, Herbert Leon. Bloodstain Pattern Interpretation (New York: Laboratory of Forensic Science, 1982).

[3]MacDonell, Herbert Leon and Lorraine Fiske Bialousz. Laboratory Manual for the Geometric Interpretation of Human Bloodstain Evidence, 2nd ed (New York: Laboratory of Forensic Science, 1979). Mac Donell, Herbert Leon and Lorraine Fiske Bialousz. Flight Characteristics and Stain Patterns of Human Blood (Washington: US Dept. of Justice, 1971).

[4]DeForest Peter R., R. E. Gaensslen and Henry C. Lee. Forensic Science: An Introduction to Criminalistics (New York:McGraw-Hill).

[5]Balthazard, V., R. Piédelièvre, Henri Desoille and L. Dérobert. "Étude des gouttes de sang projeté." Paper, 22nd Congrès de Médecine Légale, Paris: June, 1939.

The impact angle at which a drop of blood strikes a surface may be determined from the length and width of the resulting bloodstain[6]. Let A = impact angle, W = width, and L = length. Then,

$$A = \arcsin (W/L).$$

If the impact angles of several bloodstains are known, this information can be combined with the radial distances at which these bloodstains lie from the point of convergence[7], to yield the distances from the blood-stained surface at which the drops of blood originated. Then, statistical interpretation can indicate the probable locations of the points of origin of the drops of blood. In general, victim location can then be inferred from the results.

If a great number of bloodstains are to be examined, data handling quickly becomes a burden. This burden increases if the analyst wishes to sort out bloodstains caused by multiple impacts to the victim. If the analyst wishes to obtain an averaged distance of the point of origin from the point of convergence based on several bloodstains, or a statistical distribution of impact angles in order to eliminate outliers, the process again becomes unwieldy.

To facilitate a more accessible application of the above technique, the authors have developed a BASIC-language program to build a database, perform

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[6]De Forest, p. 300.

[7]Bloodstains may be found to lie in a radially distributed pattern with their long axes aligned parallel to the radials. If radials from all the bloodstains are traced back to a common point on the same surface, such a point is called the point of convergence.

the necessary calculations, and display the results both numerically and graphically. At this time, the program is not a sophisticated package, but only a first-generation automated approach to the same task performed manually. Planned future improvements include the capability to rotate the viewpoint of the graphics, to place a human figure in the product, to provide automatic statistics, and to remove outliers from the database. The program runs on a TEK-4052 Graphic Computing System, but could easily be rewritten for many other microcomputers.

This program has been tested on several data sets, including measurements taken from laboratory simulations as well as from actual crime scenes. The results correspond exactly with those independently obtained using manual methods.

To use the program, the analyst must first collect bloodstain widths, bloodstain lengths, and distances from the various points of convergence found at the crime scene. Methods for accomplishing this task are fully described in MacDonnell and Bialousz.[8] Further, the locations of the points of convergence, as measured from one corner of the room, must be noted. These locations will enable the program to display the origins of the bloodstains on a perspective drawing. The analyst then enters the collected data into the program, and may optionally save it to floppy disk. Bloodstain measurements collected from six separate vertical surfaces and six separate horizontal surfaces may be entered into the program. At present, the program can be used to place four points of origin in 3 dimensions, using the information from 360 bloodstains to place the points at the moment of impact. Confidence levels generally indicate a very

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[8]MacDonell and Bialousz, Laboratory Manual, p. 17-27.

small probability of error when numerous bloodstains are measured, which indicates that the points of origin can be placed with a high degree of reliability.

Figure 1 displays the results of the analysis of one bloodstain, as produced by the program. For a bloodstain of width 9 mm and length 15 mm, located 340.0 mm from the point of convergence, the program calculated that the blood drop hit the surface at an incident angle of 36.9° and that it originated at a point 255 mm above the surface. When twelve such bloodstains from three separate points of origin were displayed on one graph (Figure 2), the program successfully resolved the bloodstain pattern into three separate events occurring at three different points of origin. On Figure 2, the vertical axis represents the bloodstained wall, and the horizontal axis, the distance of the point of origin from the wall. Heights are in 10 Cm intervals and horizontal distances from the axis of convergence are in 100 mm intervals. The scale of all graphs is under user control. Figure 3 represents the computed location of the points of origin of three separate impact patterns which were sorted out by the program from the raw data. Indicated are the distances, in Cm, of the victim's head and stomach from the north wall, west wall, and floor of the crime scene. Information used to connect the computed points of origin with specific wounds to the victim is not a feature of the computer program. This information must be established through forensic analysis. By combining examination of the victim with the results of this program and with an examination of tissue types found in the bloodstains, the authors were able to establish in this laboratory example that the victim was shot twice in the head, once while leaning forward, and once while almost prone. Further examination of the bloodstains and the victim can sometimes be used to estab-

lish the order in which the wounds occurred. In this case, the victim was first shot once in the stomach while standing, as the height of the computed point of origin agrees with the height of the victim's midsection while standing.

Once the point of origin of bloodstains is established and confidence levels assigned for the positioning of each point, the analyst can proceed, as above, to establish a causal link between the computed points of origin and the various wounds to the victim. Once the victim's position in space is established in this way, medical examination can frequently determine the angle of impact of the weapon to the victim. This information may in turn place the weapon at the crime scene, which may, in turn, place the assailant. Therefore, the automated bloodstain analysis program is just one of many methods which may be applied sequentially or concurrently to reconstruct the sequence of events at a crime scene.

Bloodstain width, MM
9
Bloodstain length, MM
15
Distance to axis of origin, MM
340
Width,MM
9
Length,MM
15
Distance,MM
340
Angle
36.8698976458
Tangent
0.75
Height,MM
255

figure 1

figure 2

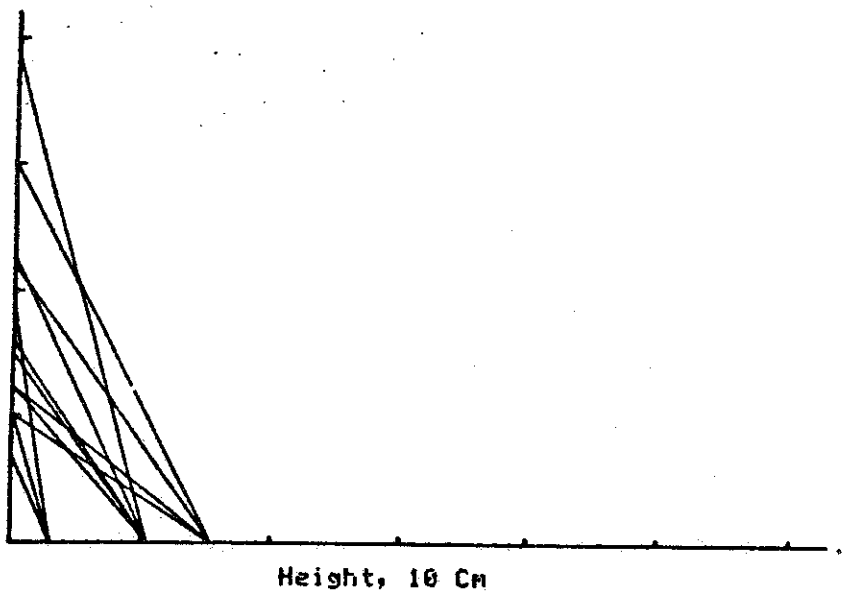
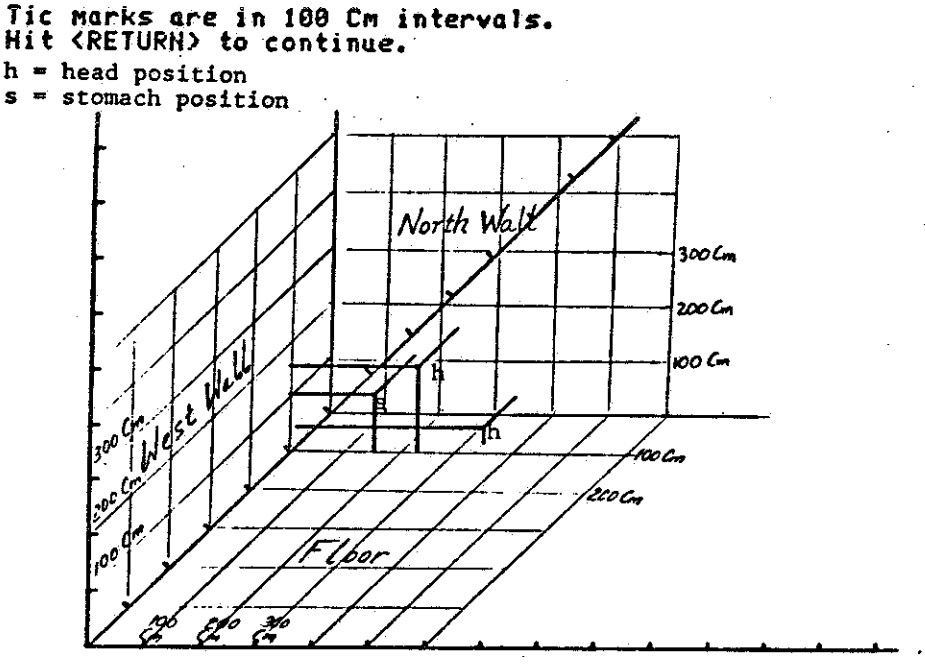


figure 3



Authors: Frederick E. Wilson
Crime Analyst / Programmer
Crime Analysis Unit
Eugene PD

Donald Schuessler
Lab Technician
Crime Lab
Eugene PD

CALIFORNIA ASSOCIATION OF CRIMINALISTS will hold their semi-annual meeting October 24, 25 & 26, 1985 at the New Otami Hotel and Garden in Los Angeles, California.

For further information contact: Greg Matheson
Los Angeles Police Dept. Laboratory
150 North Los Angeles Street, Room 435
Los Angeles, California 90012
(213) 485-2535

MID-ATLANTIC ASSOCIATION OF FORENSIC SCIENTISTS will hold their Fall 1985 meeting at the Sheraton Inn, Dover, Delaware on October 17 and 18, 1985.

For further information contact: Carol Wilkinson
Delaware State Police Laboratory
P.O. Box 430
Dover, Delaware 19903

MIDWESTERN ASSOCIATION OF FORENSIC SCIENTISTS will hold their Fall 1985 meeting at the Holidome at the Pyramids, Indianapolis, Indiana on October 9,10 & 11, 1985.

For further information contact: Diane K. Tolliver
Indiana State Police
Room 102, State Office Building
100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 373-1414

NORTHEASTERN ASSOCIATION OF FORENSIC SCIENTISTS will hold their annual meeting October 11 and 12, 1985 at the Long Island Marriott in Uniondale, New York.

For further information contact: Heljena M. McKenney
408 Elmwood Avenue
Feasterville, Pennsylvania 19047
(215) 355-3970

NORTHWEST ASSOCIATION OF FORENSIC SCIENTISTS will hold their Spring 1986 meeting at the Inn of the Seventh Mountain, Bend, Oregon from April 29 through May 2, 1986.

For further information contact:

Michael A. Howard
Oregon State Police Crime Laboratory
375 N.E. Franklin Street
Bend, Oregon 97701
(503) 388-6150

SOUTHWESTERN ASSOCIATION OF FORENSIC SCIENTISTS will hold their Fall 1985 meeting at the Houston Quality Royale (Astrodome) from October 31 through November 2, 1985-

For further information contact:

Floyd McDonald
Pasadena Police Department
1114 Davis Street
Pasadena, Texas 77502
(713) 475-7866

KANSAS BUREAU OF INVESTIGATION

DIVISION OF THE OFFICE OF ATTORNEY GENERAL
STATE OF KANSAS
1620 TYLER
TOPEKA, KANSAS 66612
(913) 232-6000

THOMAS E. KELLY
DIRECTOR

ROBERT T. STEPHAN
ATTORNEY GENERAL

July 16, 1985

Northwestern Association of
Forensic Scientists
1111 SW Second
Room 1201
Portland, Oregon 97204

Dear Sir:

Would you please list the below position vacancy in the Northwestern Association of Forensic Scientists bulletin.

The Kansas Bureau of Investigation is seeking applicants for the below listed position:

CRIMINALIST II - FIREARMS EXAMINER

This position offers an opportunity to be the lead Firearms Examiner in the Headquarters Laboratory. Minimum requirements include a BA Degree and court qualification as a firearms examiner. Experience as a firearms examiner can be substituted for the degree requirement on a year for year basis to fulfill four year requirement.

The salary range for this position is $23,292 to $31,212.

Please send resumes to Laboratory Administrator, Kansas Bureau of Investigation, 1620 SW Tyler, Topeka, Kansas 66612, or contact Ron Jones or Bob Olsen at (913) 232-6000.

Thank you for your cooperation.

Sincerely,

THOMAS E. KELLY
DIRECTOR

Ronald L. Jones

RONALD L. JONES
Laboratory Administrator

RLJ:klo

"THE MEANING OF THE LOGO"

The color scheme is in three parts: Gold meaning Science, Blue meaning Truth and Purple meaning Justice.

The four pictures of equal balance are The Scales of Justice, The Torch of Knowledge, The Microscope denoting Criminalistics or Forensic Science and The Fasces, the Symbol of Authority.

The Association's name is part of the Logo and the pharmaceutical symbol ℞ denotes the Association as having scruples.

The Editor

THE NEWSLETTER

Newsletter published by the Association dedicated to the:

1. encouragement of the exchange of ideas and information within the field of forensic sciences through improving contacts between persons and laboratories engaged in the forensic sciences;

2. stimulation of research and the development of new and/or improved techniques; and

3. promotion of the improvement of professional expertise of persons working in the field of forensic science.

SUGGESTIONS FOR CONTRIBUTORS

The Newsletter includes the following regular features:

1. Correspondence and inquiries (letters)
2. Methodological notes (bench top)
3. Abstracts of papers presented at NWAFS meetings
4. Short technical reports
5. Case reports
6. Employment opportunities
7. News of meetings, schools, workshops, training opportunities
8. Legal news
9. Editorials

Contributions should be titled, include author credits and any pertinent references. The contributions should be typed, single spaced, on plain white paper and compacted as much as possible.

Submit all contributions to the Newsletter Editor:

George K. Matsuda
Oregon State Police Crime Laboratory
1111 S.W. 2nd Avenue, Room 1201
Portland, OR 97204

The Newsletter is published four times a year. Contributions should be submitted by February 1, May 1, August 1 and November 1, each year.

NOTICE IMPORTANT NOTICE IMPORTANT NOTICE IMPORTANT NOTICE IMPORTANT

UNLESS YOU COMPLETE THE INFORMATION BELOW AND SUBMIT THIS FORM TO THE NEWSLETTER EDITOR BEFORE OCTOBER 15, 1985 YOUR LISTING IN THE NWAFS 1986 ROSTER WILL APPEAR

AS

ARNOLD MELNIKOFF

Division of Forensic Science, Laboratory
275 W. Front Street
Missoula, Montana 59801
(406) 728-4970

. . . . . fold here . . . . . .

Name _____

Title _____

Agency _____

Address _____

_____

Phone Area code _____ Number _____

Area of expertise _____

today's date _____

. . . . . fold here . . . . . .

Northwest Association
of
Forensic Scientists

1111 S.W. 2cd. Rm 1201
Portland, Oregon 97204

NWAFS NEWSLETTER EDITOR

1111 S.W. 2cd. Rm 1201

Portland, Oregon 97204

STATE
OF
MONTANA
DIVISION OF FORENSIC SCIENCE
DEPARTMENT OF JUSTICE
275 West Front Street, Missoula, MT 59802 (406) 728-4970

Ronald L. Rivers, M.D.
State Medical Examiner

Arnold B. Melnikoff
Laboratory Bureau Chief

Dawn M. Kangas
Administrative Assistant

The Department of Justice, Forensic Science Division, is currently recruiting for the following position. Application information is available by contacting Jim Hutchison, Division of Forensic Science, 275 West Front Street, Missoula, MT 59802 Telephone (406)728-4970

Forensic Scientist III, Grade 15. Employees new to state government will customarily begin at an annual salary of $21,231. Location: Missoula Montana

Duties and Responsibilities: Responsible for the analysis and identification of ethanol and other volatile substance in biological fluids submitted to the forensic laboratory for examination. Will be required to prepare written reports and give expert oral testimony in a court of law as to the results of the examination. Will be responsible for maintaining Intoxilyzer 5000 breath analysis instruments located throughout the State. Extensive travel involved with courtroom testimony and instrument maintenance program.

Qualifications: A Bachelor's degree in a physical or biological science, with a minimum of three years experience as a Forensic or Clinical Toxicologist.

Application Procedure: Interested parties should submit a State of Montana application and form PD-25A to Jim Hutchison, Department of Justice, Division of Forensic Science, 275 West Front Street, Missoula, Montana 59802.

Application Deadline: 30 September 1985

The Department of Justice is an AA/EEO Employer

Arnold Melnikoff
Montana State Criminal
Investigation Laboratory
275 West Front Street
Missoula, Montana 59801