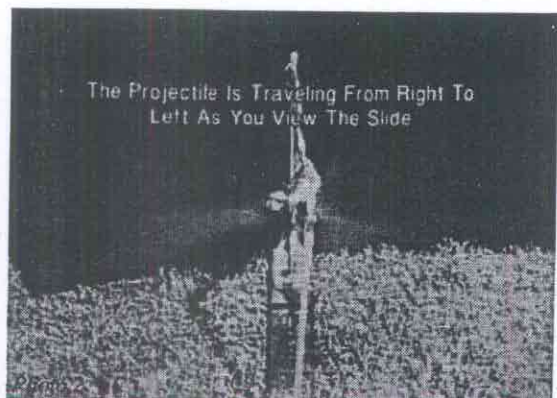


The JFK Case: What Does the *Blood* Tell Us?

By Sherry Pool Gutierrez, presented as part of the Forensic Techniques Panel and previously in the Assassination Chronicles December, 1995.

In the years since President Kennedy's death, great strides have been made in various technical fields. Many interested parties have applied their time, education, abilities, and efforts to determine what really happened on that dismal November day. Laymen who dedicate their lives to putting pieces of seemingly unrelated information together, scientists and criminologists who apply the latest technical knowledge to fit or discover new pieces of the puzzle, and researchers who look to what may have been at that time an insignificant bit of information to develop a comprehensive or new insight surrounding his death. But despite all these gains, disputes about basic evidence still trouble us.

One area of dispute has been the shot to the head of President Kennedy. Was the shot from the back or from the front?

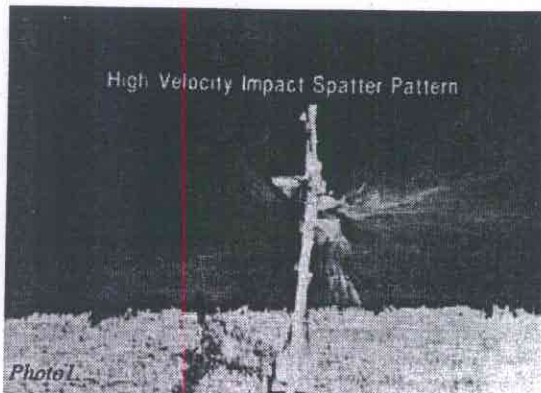


The Projectile Is Traveling From Right To Left As You View The Slide

commonly created as the result of a gunshot injury.

To construct standards and study bloodstain patterns created as the result of a gun shot injury, a sponge containing blood was placed in the path of a bullet. A video tape was used to capture the bullet passing through the bloody sponge (*Photograph 1*). The video tape employed has a speed of 30 frames per second. The projectile used was a Federal .45 caliber 230 grain bullet, and was traveling at approximately 850 feet per second. The video utilized approximately 5 frames or 1/6 of a second to capture the resulting pattern. This means the pattern is created in its entirety in less than 1 second. The faster the velocity of the projectile, the more quickly the resulting pattern is created. However, the blood does not travel at the same speed as the projectile.

Blood projected out of the exit wound and traveling in the same direction as the projectile is traveling much slower than the bullet, but faster than the blood projected back toward the shooter. Blood is projected back towards the shooter through

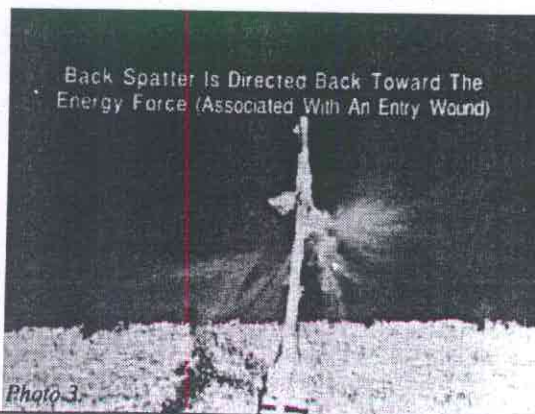


High Velocity Impact Spatter Pattern

Photo 1

Was there more than one gunshot wound to the head? Is it possible there were two simultaneous shots from the front and back? And most importantly, is there physical scientific evidence which can undisputably satisfy these questions? There is one field of study which can address those questions, and perhaps more importantly, answer them in a manner in which the average person can understand and reach the same conclusions as the experienced analyst.

For many years Bloodstain Pattern Analysis has made a significant contribution to the scientific investigation of violent crime scenes by assisting with the reconstruction of the event in which blood was shed. Blood spatter analysis or evaluation is the study of the fixed results of bloodstains disbursed onto a target surface as the result of some type of force impacting blood. As a liquid, blood is very uniform and reacts as all liquids do. Because blood reacts in predictable, consistent, and reproducible manners, the bloodstain pattern analyst can create examples or patterns; these are called standards. One type of pattern duplicated in the production of standards is the high velocity, forceful impact spatter pattern. This type of pattern is most



Back Spatter Is Directed Back Toward The Energy Force (Associated With An Entry Wound)

Photo 3

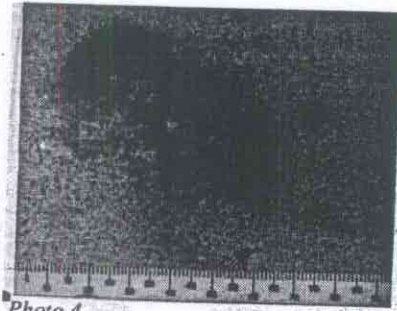


Photo 4.

the entry wound. The amount of blood used in the sponge does not affect the characteristics of the patterns created, but it does impact the diameter of the resulting pattern. The more blood used, the greater the diameter of the pattern.

Regardless of the amount of blood used or the type or velocity of the projectile used, a consistent pattern with uniform characteristics is created. The characteristics include: (1) a cone-shaped pattern with a multitude of minute blood droplets, (2) many blood droplets with diameters of .02 mm to .04 mm, (3) which creates a "mist" as the distance from the injury site increases, and (4) the diameter of the pattern increases as the cone opens. The video frames were carefully studied to determine what happens when a bullet strikes a bloody target.

In every instance, blood was disbursed back toward the shooter and propelled forward in the continued direction of travel of the projectile (Photograph 2). Even in the event of no exit through the bloody target, blood is projected back towards the shooter. The blood droplets left the impact site on the bloody sponge in a "cone-like" configuration. The distribution of the droplets was more concentrated when near the sponge, with the distance between the droplets increasing as the droplets moved away from the sponge.

Back spatter is created as blood is forcefully expressed from an entry wound, back toward the source of the energy, as the result of increased pressure within the tissues (Photograph 3). To document the diameter of the individual stains produced in back spatter, cardboard sheets were placed vertically before and after the target sponge. The analysis of the droplets captured on the cardboard target indicate a multitude of

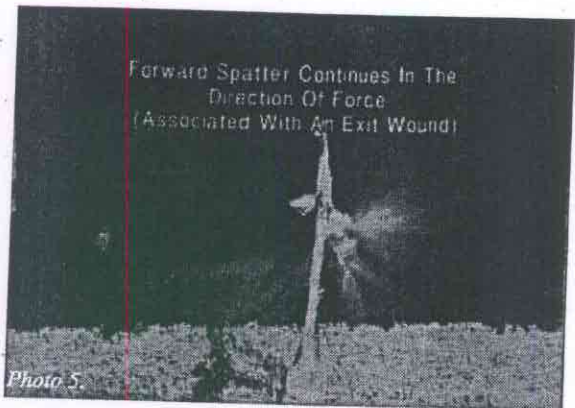


Photo 5.

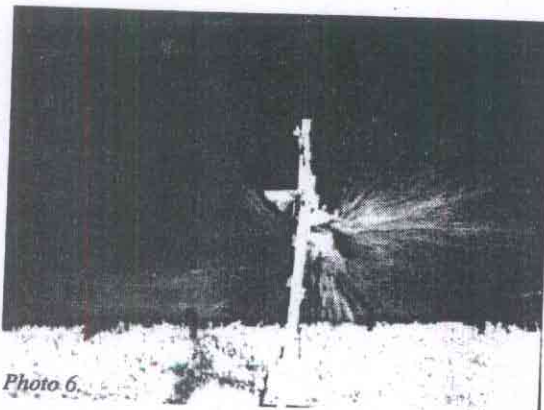


Photo 6.

minuscule blood droplets resembling an atomized spray or mist created, with the majority of the stains having a diameter of .10mm or less. A 1:1 photograph of this type of pattern is shown with a millimeter scale with .10mm increments displayed. This photograph is viewed best with a magnifying glass to appreciate the quantity, distributions and dimensions of the individual stains (Photograph 4).

Forward spatter is blood which travels in the same direction as the source of the impact and is associated with gunshot exit wounds (Photograph 5). The number of droplets, the occurrence of sponge pieces dispersed throughout the blood droplets, the distance the droplets travelled, and therefore the diameter of the pattern consistently increased on forward spatter patterns. The diameter of the individual droplets and the appearance of a bloody mist, were consistent with those created in back spatter patterns.

The primary difference in forward and back spatter, with the exception of the direction of travel in relation to the bloody target, is the fragments of the bloody sponge permeating the forward spatter pattern. Neither the type of bloody target (sponge, wood, plastic, cloth), nor the amount of blood on or within the target, nor the velocity of the projectile changed in any significant way the basic characteristics of the patterns created.

The patterns produced in the video are consistent with the type of patterns created in a gunshot injury to a person. A single projectile would produce a cone-shaped mass of blood droplets which would originate at both the entry and exit sites. With no exit wound, only the back spatter pattern would be created. In gunshot injuries to persons, bits of tissue or bone are often disbursed with the blood droplets in exit wounds, and in very high velocity injuries, may occasionally be found in back spatter patterns.

If the analysis techniques described are applied to both the scene of President Kennedy's shooting and the Zapruder film, I believe we can answer conclusively the following questions:

Was there more than one gunshot wound to the head?

Both back and forward spatter are generated from a single projectile creating an entry and exit wound. If blood is observed in front of the President's face, as in witnesses statements and the Z film, and blood, tissues and bone was

discovered behind the President, it is appropriate to conclude that one projectile created both patterns.

Was the gunshot injury to the President's head from the back or the front?

The physical evidence on the scene documented blood, tissue, and bone to the rear of the President's head. It was found on motorcycle police officer Bobby Hargis, the back of the limousine, and in the roadway. This type of evidence is consistent with forward spatter and an exit wound. Back spatter would have been located in front of the President's head. In the Zapruder film, frames 313 and 314, what appears to be a mist of blood is obscuring the face of the President. This is consistent with back spatter. One of the witnesses, Mr. William Newman, described that mist to me as "a cloud of blood." This is a good description of the blood viewed in both the Zapruder film and in Photographs 1-4. Based on statements by witnesses in the death of President Kennedy describing blood spatter they observed, and documentation of blood spatter in the Zapruder film, it is my conviction the head injury to President Kennedy was the result of a single gunshot fired from the right front of the President.

Is it possible there were two simultaneous shots from the front and back?

Two shots would have resulted in two back spatter and two forward spatter patterns. There is no large amount of blood, tissue, or bone discovered in front of the President to support the theory of an entry wound from the back of the head creating a forward spatter pattern in front of the President. It was Dallas Police Officer Bobby Hargis who displayed the blood consistent with forward spatter, not Governor John Connally.

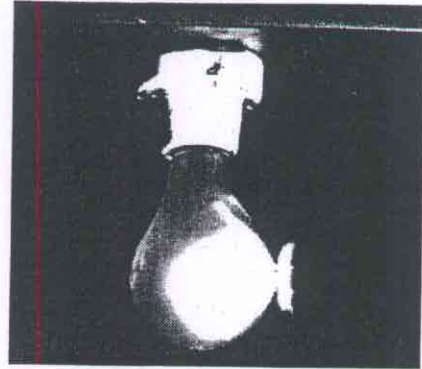
Why isn't all the forward and back spatter pattern shown on the Zapruder film?

According to testimony, the Zapruder film was recording action at approximately 18 frames per second. A regular video tape records at 30 frames per second. The patterns are created, from the first action to the last, in 5 frames. This means the blood droplets are moving faster than they can be captured on the Zapruder film. Two of the Zapruder frames do display high velocity impact spatter which seems to be appropriate when you consider the ratio of the pattern movement and the frame speed of each of the videos.

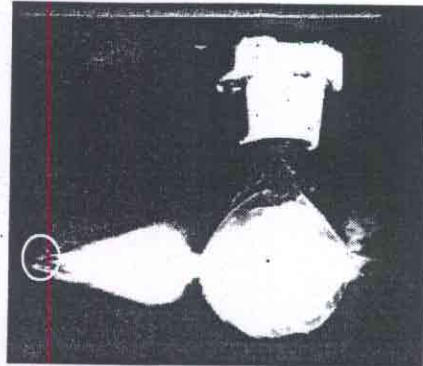
Remember to consider what was found on the scene, and do not become locked in on the evidence on the Zapruder film as the only bloodstain evidence available for consideration.

How did the bloody sponge react when the projectile struck it?

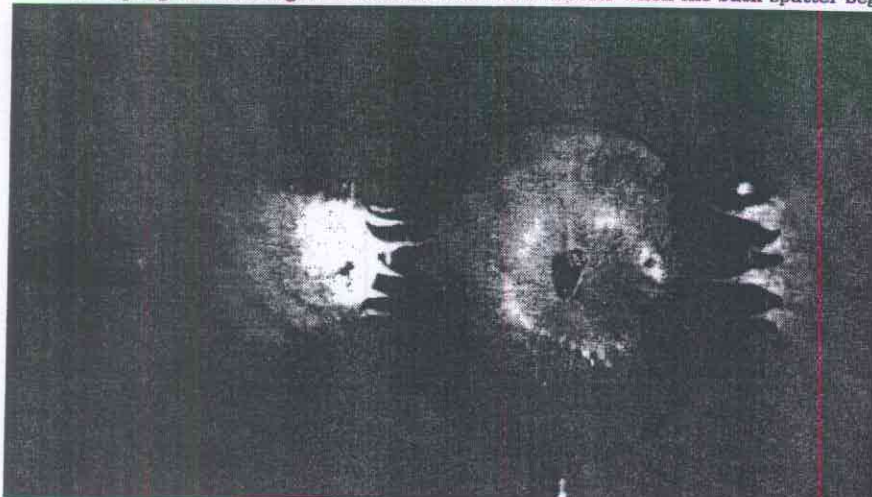
The sponge made a slight movement toward the shooter when the back spatter began, and then moved more force-



a. Lightbulb with bullet entering from right to left, showing backspatter pattern.



b. Lightbulb with bullet entering from right to left, showing both back and forward spatter. Bullet is circled.



A bullet shot from right to left, showing evidence of back and forward spatter.

fully with the projectile as it exited the bloody target. In Photograph 6 the projectile is moving from right to left. This frame captures the moment as the back spatter is fully developed and the forward spatter has just begun to unfold. The bloody sponge was suspended by string to allow for movement. In this frame the sponge can be observed to the right of the supporting structure holding the bloody target, promoting the theory of initial forward movement, however slight. Photograph 2, taken with a different sponge holding far less blood, displays the proportion larger forward spatter and the sponge to the left of the support structure. The sponge movement was more pronounced in the forward spatter, as it had the energy of the projectile to sustain it.

Are the findings presented here, when considering bloodstain pattern evidence, consistent with the type of patterns found on death scenes investigated by law enforcement agencies today?

Yes. Analysis of bloodstain patterns on crime scenes is routinely used in law enforcement. Both international and U.S.-based professional organizations recognize bloodstain evidence analysis techniques as valid investigative tools. This type of information is based on the study of research performed by many criminalists, with the initial research performed by Herbert MacDonell. Law enforcement agencies internationally provide professional training and education in this field, with hands-on reconstruction of bloodstain patterns. Based upon specialized training and field experience obtained by using this technique on actual crime scenes with gunshot injuries, the findings presented are consistent with analytic conclusions which would be reached if President Kennedy's death were being investigated today.

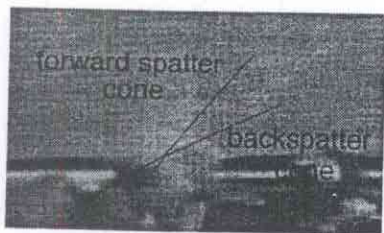
Therefore, supported by the statements by witnesses in the death of President Kennedy describing the bloodspatter they observed; blood, tissue, and bone deposited on persons and surfaces located behind the President; and the documentation of blood spatter in front of the President in the Zapruder film, I am convinced the head injury to President Kennedy was the result of a single gunshot fired from the right front of the President.

About the author:

Sherry Gutierrez, a Certified Crime Scene Analyst, is presently a consultant to District Attorneys and Law Enforcement Agencies in the fields of Crime Scene Investigation and Reconstruction, and Bloodstain Pattern Analysis. A full listing of Mrs. Gutierrez' numerous published works, achievements, professional affiliations, and professional education are available upon request to JFK-Lancer.

Additional Reading:

- Bloodstain Patterns, Herbert L. MacDonell, 1993 Interpretation of Bloodstain Evidence at Crime Scenes, William Eckert and Stuart James, 1989
- Forensic Science, an Introduction to Criminalistics, Peter DeForest, R.E. Gaensslen, and Henry Lee, 1983 Criminalistics, and Introduction to Forensic Science, Richard Saferstein, 1987
- Physical Evidence in Criminal Investigations, Henry Lee, R.E. Gaensslen, Elaine Pagliaro, Robert Mills, and Kenneth Zercie, 1991



Z-Frame 313 showing (cloud or mist) back and forward spatter.

Mrs. Gutierrez, after attending the November In Dallas Z-film workshop, concluded that frames may be missing from this section of the film, explaining why the forward spatter is not more readily observed in this frame.

