The Bizarre Case of People v. Contreras

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Introduction

At 0226 hours on December 29, 1998, emergency 911 in National City, California, received a call from a female that her boyfriend had just shot himself in the head and was bleeding from the mouth. At 0257 the boyfriend, Anselmo Vasquez, was pronounced dead at the scene from a single .22 bullet wound to the chest. Thus began the bizarre case of People v. Delia Rabina Contreras. The first trial of Ms. Contreras was in July, 1999 and she was convicted of the murder of Anselmo Vasquez. Ms. Contreras was granted repeal based on a Miranda issue and had two additional trials. The second trial (January, 2003) resulted in a mistrial (hung jury) and she was convicted in the final trial (September, 2003).

This case has been previously published (Burnett, 2001). The purpose of this article is to reexamine the extraordinary nature of the physical evidence of this case and discuss the testimony of three experts who testified in one or more of the three trials.

The Case

Mr. Vasquez, the victim, was apparently cleaning up pieces of a broken bedroom window glass (as evidenced by stacked glass pieces, Fig. 1A) and appeared to have been shot at this time. The right side of the window had been broken from the outside sometime earlier that evening. There is evidence (discussed below) to suggest that Mr. Vasquez was involved in a physical altercation that apparently occurred outside of his apartment prior to his death.

The Medical Examiner's report (12/30/1998) noted, "Autopsy showed a single penetrating gunshot wound of the right chest which traveled from to back and right to left injuring the aorta in two places and perforating both lungs. The entrance wound showed no soot or tattooing… The mechanism of death was exsanguinations secondary to aortic injuries due to the single gunshot wound to the chest."

Ms. Contreras, admitted shooting the victim during her questioning. When she was asked what she did with the murder weapon (later determined to be a .22 Marlin rifle) she could not provide a location. The weapon was never found. Ms. Contreras later recanted her confession. The physical evidence of this homicide indicates her confession was likely false.

On July 12, 1999 I received a call from the defense attorney with a request to review the evidence against his client, Ms. Contreras. The trial started less than two weeks after my retention. The following day the attorney visited my laboratory with several of the crime scene and autopsy photographs. One of those photographs showed a cracked window in the bedroom where the part of that window on the right side had been broken (Fig. 1B). The cracked window on the left side had a defect resembling a rising sun (Figs. 1C and 1D).

Ms. Contreras was convicted of the homicide in early August, 1999 (the first trial).

Following this first trial of Ms. Contreras, I continued to research the interaction of lead .22 bullets with window glass. It was apparent the fatal bullet penetrated the window near a previously existing crack (Figs. 1B, 1C and 1D). This research dealt with the characteristics of window glass defects when a bullet hits near or on a previously existing crack, and with the nature of deformation of bullets that interact with cracks in the window

Figure 1. The second bedroom/stroeroom and its window. A: The broken window removed from its frame and positioned against the bed, likely by the victim. Some of the glass is stacked against the window. B: The bedroom with its window. The right side portion of the window had been removed and placed against the bed as shown in Fig. 1A. C: The unusual defect in the left panel of the window. D: A larger view of the defect. A RGB levels change as well as sharpening were performed in order to bring out more detail in the image.

glass. The result of my work was published in the Journal of Forensic Sciences (Burnett, 2001). This article as well as the results of additional research will be presented here.

Key investigative questions of the physical evidence:

1) Was the defect in the bedroom window likely caused by a bullet? Can the features of the window defect be simulated by a .22 bullet fired at previously cracked windows?
2) Does the interaction of the bullet with a crack in the window affect both the behavior of the bullet as well as change its structure?
3) What are the characteristics of a .22 bullet that has impacted a window and then hit his clothing and soft tissue?
4) Gunshot residue (GSR) samplers of Ms. Contreras's hands were taken at the police station where she was being questioned. These proved to be positive according to the gunshot residue expert, Steve Dowell. Ms. Contreras' hands were not protected from contamination while she was in the police environment. Could these so-called GSR particles be the result of contamination while she was in the police car and at the police station?
5) A 0.5-inch diameter blood stain in the alley outside of the apartment proved to be the victim's blood by

DNA analysis. This blood stain was proposed as having come from the defendant while she was allegedly disposing of the murder weapon. What is the nature as well as the likely origin of this blood stain?

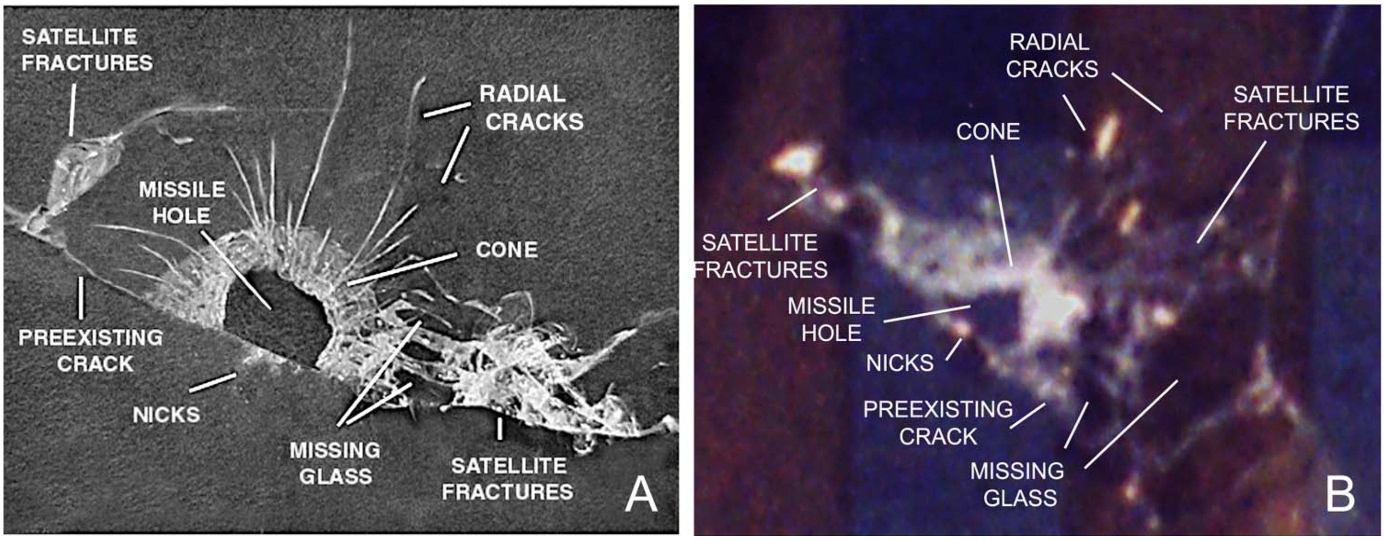

Figure 2. *A: Test .22 bullet through a previously cracked window. Features of the "rising sun" defect are marked. From Burnett (2001). B: The defect in the window at the crime scene. Virtually all the features found in the test window defect are found in the crime scene defect.*

The Window. After twenty-two shots of .22 bullets through previously cracked windows, a defect similar to the crime scene window defect was generated. Indeed, all the features found in the "rising sun" experimental defect (Fig. 2A) were found in the crime scene window defect (Fig. 2B). A feature often not found with bullets that penetrate uncracked windows is the presence of satellite fracture patterns on the same side of the glass crack as the "rising sun" defect. Mushrooming followed by bullet rotation at the strike area on a glass crack appear to cause a bullet hole larger than that expected due to bullet rotation into and modifying the hole of the failed side (Burnett, 2001 and see below).

The .22 Bullet and window glass. When a lead .22 bullet hits a single-pane window, the bullet mushrooms prior to completing its penetration (Burnett, 2001). Usually a somewhat flattened mushroom occurs (Fig, 3).

When a .22 bullet encounters a crack in window glass, the form of the deformation of the bullet appears to vary depending upon the location of the bullet hit in relation to the crack, the angle of the crack within the glass and the thickness of that glass. The side of the crack where the most of that bullet hits likely fails before the other side (Burnett, 2001). This creates a step feature on the bullet (Fig. 4). Somewhat rarer is that when one glass side fails, it will do so progressively away from the crack creating a more rounded mushroom feature as the lead flows into the void (Fig. 4A). Lateral rotation of the bullet on the glass might occur (e.g. Fig. 4D).

If only a small part of the bullet (overlaps the window crack, then the unbroken side of the glass scrapes that bullet e.g., Fig. 5) before either failing or the bullet rotating off that glass edge. For the bullet shown in Fig. 5, after some initial mushrooming of the bullet on both sides of the cracked glass, the one side failed and the leading edge of the remaining glass scraped that bullet. In this example, almost the bullet's entire length was scraped (Figs. 5A and 5B). At the end of the scrape near the bullet's base, the scraping surface dipped into the bullet, leaving raised triangular features on either side of the scrape (Figs. 5C, 5D and 5E).

The test bullets do show that a previously cracked window can present a sharp glass surface perpendicular to the axis of a bullet when that bullet hits the crack. Failure of one side of the cracked window glass at the bullet hit, can and does present a unique set of circumstances to the bullet where a portion of that bullet might be scraped by the leading edge of the unbroken glass side. As to which side of the glass on a crack that fails first appears to depend upon the amount of bullet surface impacting each of the two glass surfaces. In situations where there is failure of the glass only on one side of the crack at the bullet impact, a rising sun defect is created (Fig. 2).

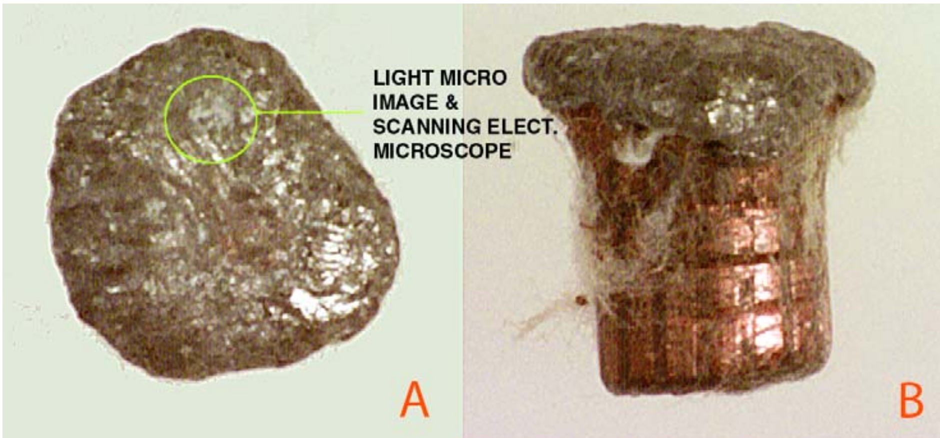

Figure 3. *Appearance of a .22 caliber lead bullet that impacted window glass and caught in a cotton box. The cotton fibers of cotton box apparently rub off tool marks from the bullet surface, but likely does not to cause much additional deformation to the bullet. A: Top view of a mushroomed bullet showing regions of powdered glass of its surface. B: side view of the same bullet. The cotton fibers adhering to the side of the bullet are from the cotton box.*

The Fatal Bullet. Although the test bullets portrayed in Figs. 3, 4 and 5 impart a foundation for postulating how the fatal bullet in this case formed, these observations have failed to provide a full exclamation for the extraordinary features on the fatal bullet (Fig. 6).

I was unable to duplicate some features of the fatal bullet in my test shots (Burnett, 2001). Tool marks on the fatal bullet were initially difficult to interpret, but I believe that there is a plausible an explanation. First, the tool marks are not parallel on the leading edge of the fatal bullet scrape, but converge toward the middle of the main tool-marked scraped surface where they become parallel (Fig. 5D). This suggests that the bullet, after mushroom formation, and the start of the breakage of the one side of the glass, rocked with slight directional shifts to the left and right on the unbroken side of the glass. Second, in this same area there appear to be two sets of tool marks that are overlapping (Fig. 5F, at red arrows). It appears that the leading and trailing edges of the unbroken glass edge were both scoring the bullet for a short time. Third, the trailing edge of the bullet scrape has laminal features that were shown to be a feature of trailing edges of a lead bullet ricochet (Burnett, 2003). Fourth, in one part of the scrape (Figs. 3D and 3E) are chatter marks. These were likely caused by vibration of a small part of the glass surface, separated from the main glass surface, that was marking the bullet (see below). A complex series of events took place in the interaction of the bullet with the window glass that cannot be explained as occurring in the body of the victim (see discussion concerning Gene Wolberg below).

Powderized window glass were found on most of the test bullets (e.g., Fig. 4B and 7A). The particles were mounted on a glass slide for viewing through a compound microscope. The obvious glass particles were submicron to more than 20 microns in size (Burnett, 2001 and Fig. 7B).

Scanning electron microscopy. A feature of scanning electron microscopes is the ability to generate elemental

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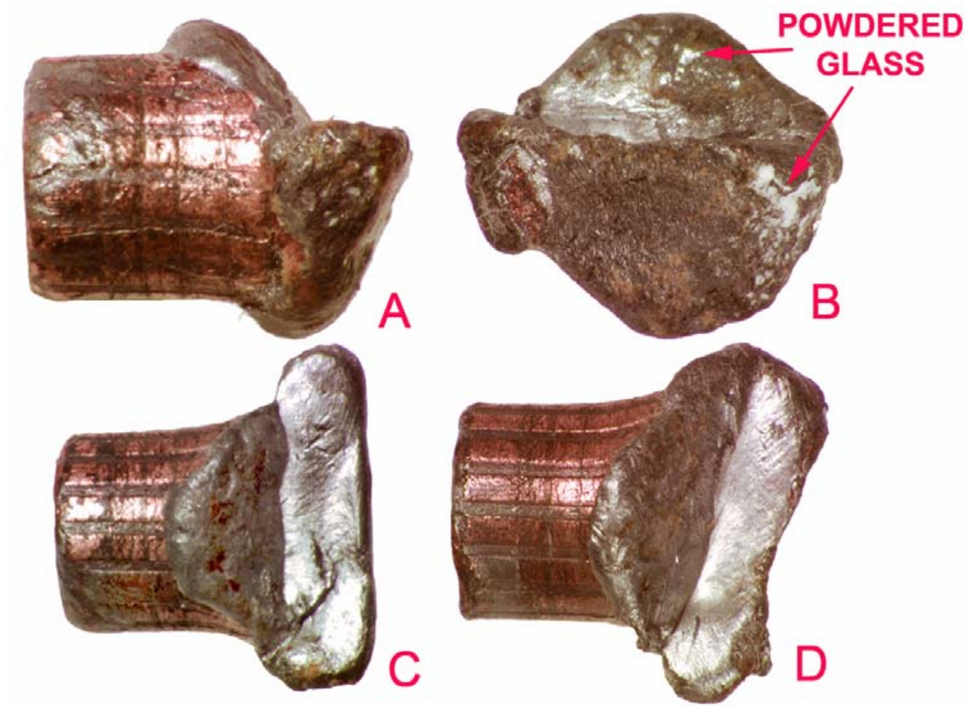

Figure 4. *Three .22 caliber bullets that have hit window glass at a preexisting crack. For each of these bullets, one side of the window glass gave way before the other, creating a "step" in the bullet. Variables such as non-uniform breaking of the window glass as well as the portions of bullet on the crack likely influence the form of the bullet mushrooming and how the bullet progresses through the window. A & B: Two aspects of the same bullet. The bullet shows a more robust mushroom than most of the other bullets. This may be due to a progressive failure of the glass away from the first bullet contact - lead flows into the enlarging space before the bullet is free of the glass. C: The side of the glass that failed first created the typical flattened mushroom (see Fig. 4). The bullet then rotates on the unbroken portion of the window glass creating the "tongue"-like feature. The lead of the tongue is molten and flows into this form as the bullet rotates on the unbroken part of the window glass and pushes the lead. D: As in Fig. 5C, but the bullet rotated latterly before becoming free of the window glass.*

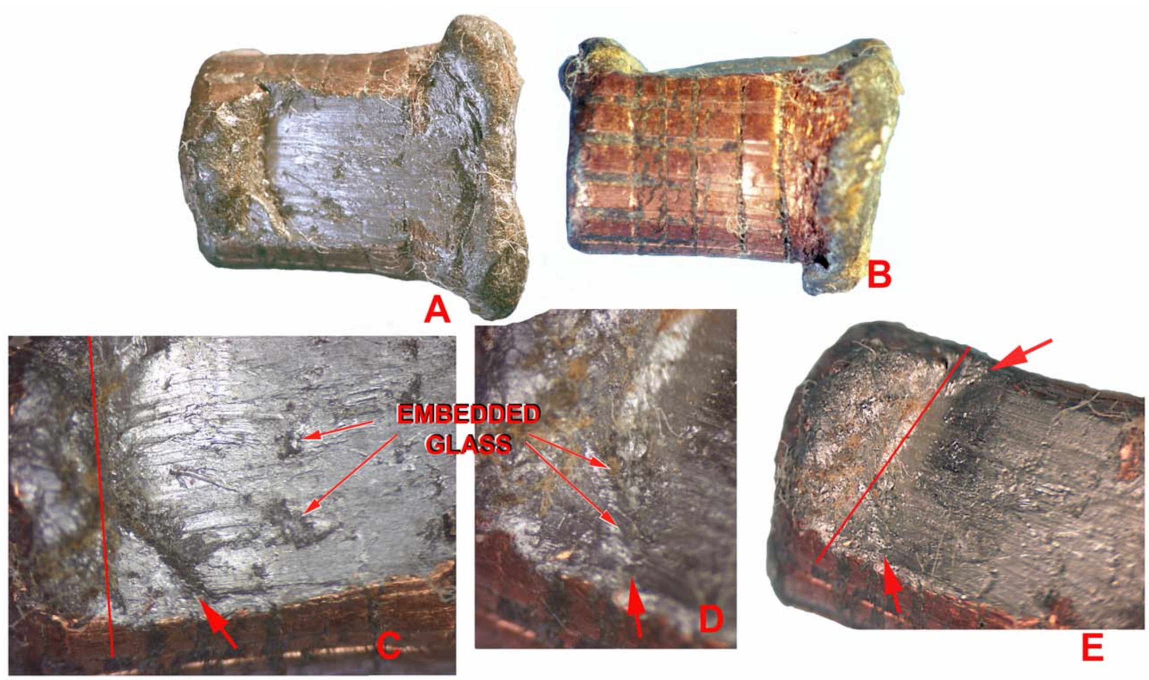

Figure 5. *A bullet that appears to have "lingered" on the unbroken side of a crack in the window glass and had been scraped along most of its length. The unbroken glass sliced into the bullet creating tool marks on that surface similar to the those observed on the fatal bullet. Most of these tool marks were obliterated by the cotton fibers of the collection box. A & B: Two lateral views of the bullet. C through E: Various views of the base of the bullet where the scraping ceased. A triangular hump on either side was created at the termination (red arrows) of the scraping. End of the scraping is marked by a red line. Tool marks are especially prominent at the termination of the scraping near the base of the bullet .*

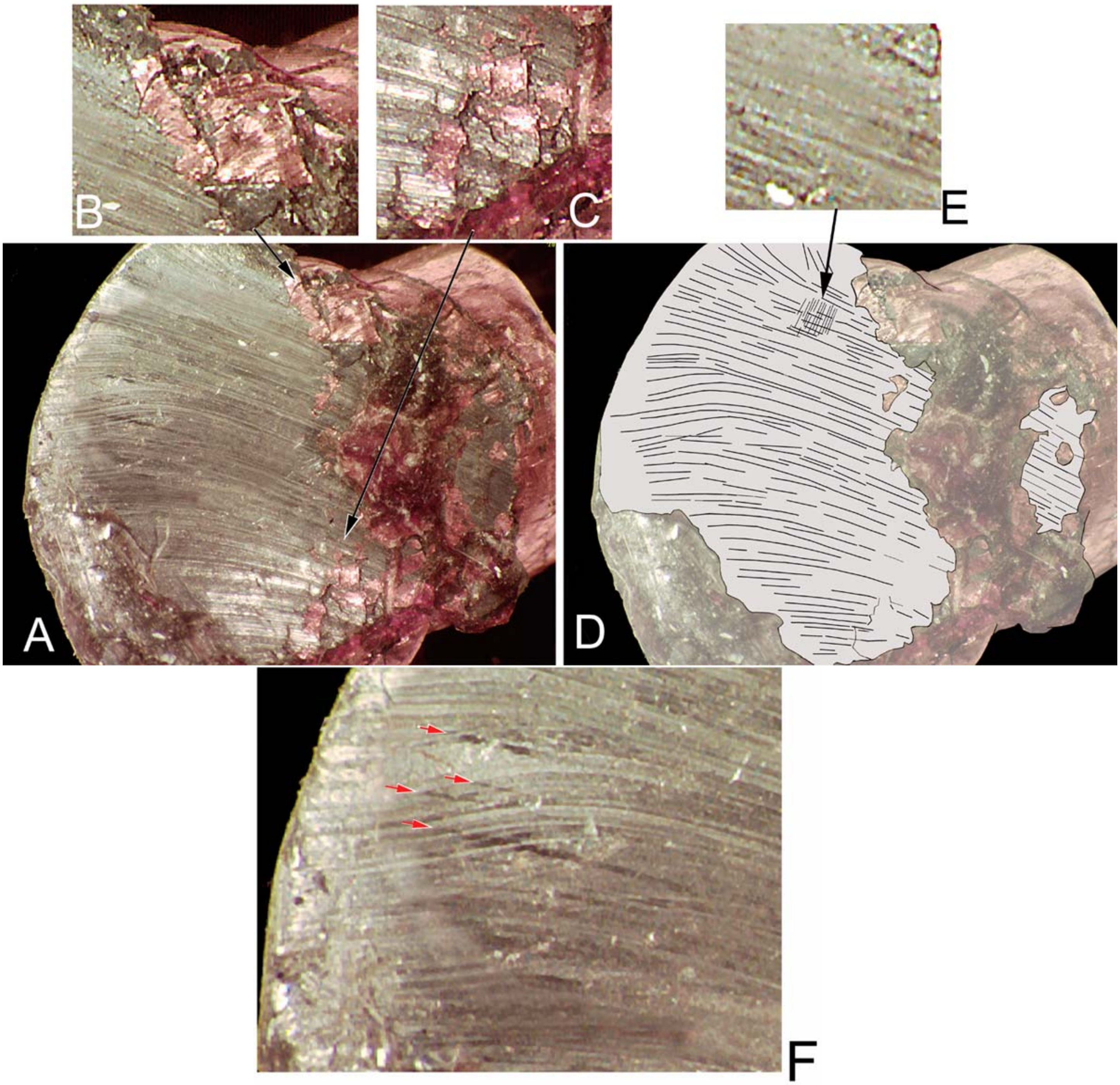

Figure 6. *The fatal bullet. A: The scraped surface showing tool marks. B: Laminal features of the right side (to the central axis of the bullet) of the scrape mark. C: Laminal features on the left side of the scrape mark. D: Line drawing superimposed on the scrape marks reflecting the directions of the tool marks. E: Enlargement of area shown on D where chatter marks were observed. The surface that caused this feature must have been vibrating in this area to create this feature. F: Apparent set of tool marks (at red arrows) underlying the more prominent tool marks.*

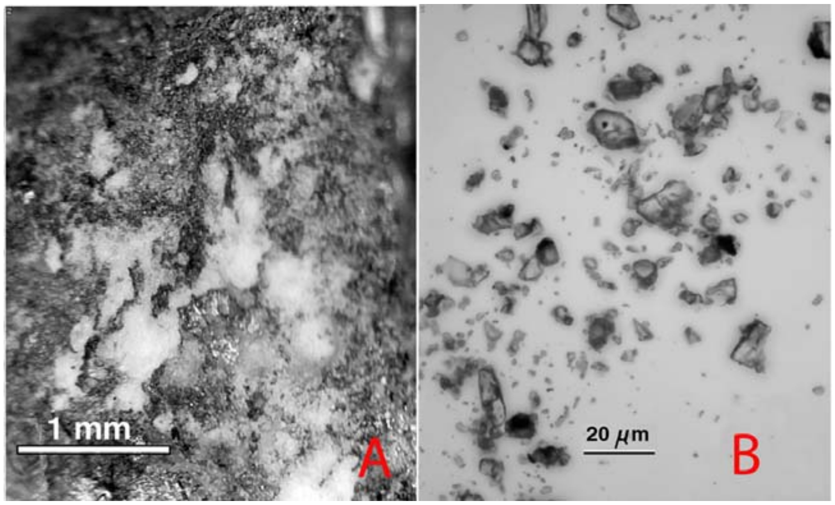

Figure 7. *Powderized glass. A: On the surface of a test bullet that went through window glass. B: The glass particles from a bullet mushroomed surface mounted on a glass slide for imaging through a compound microscope (from Burnett, 2001).*

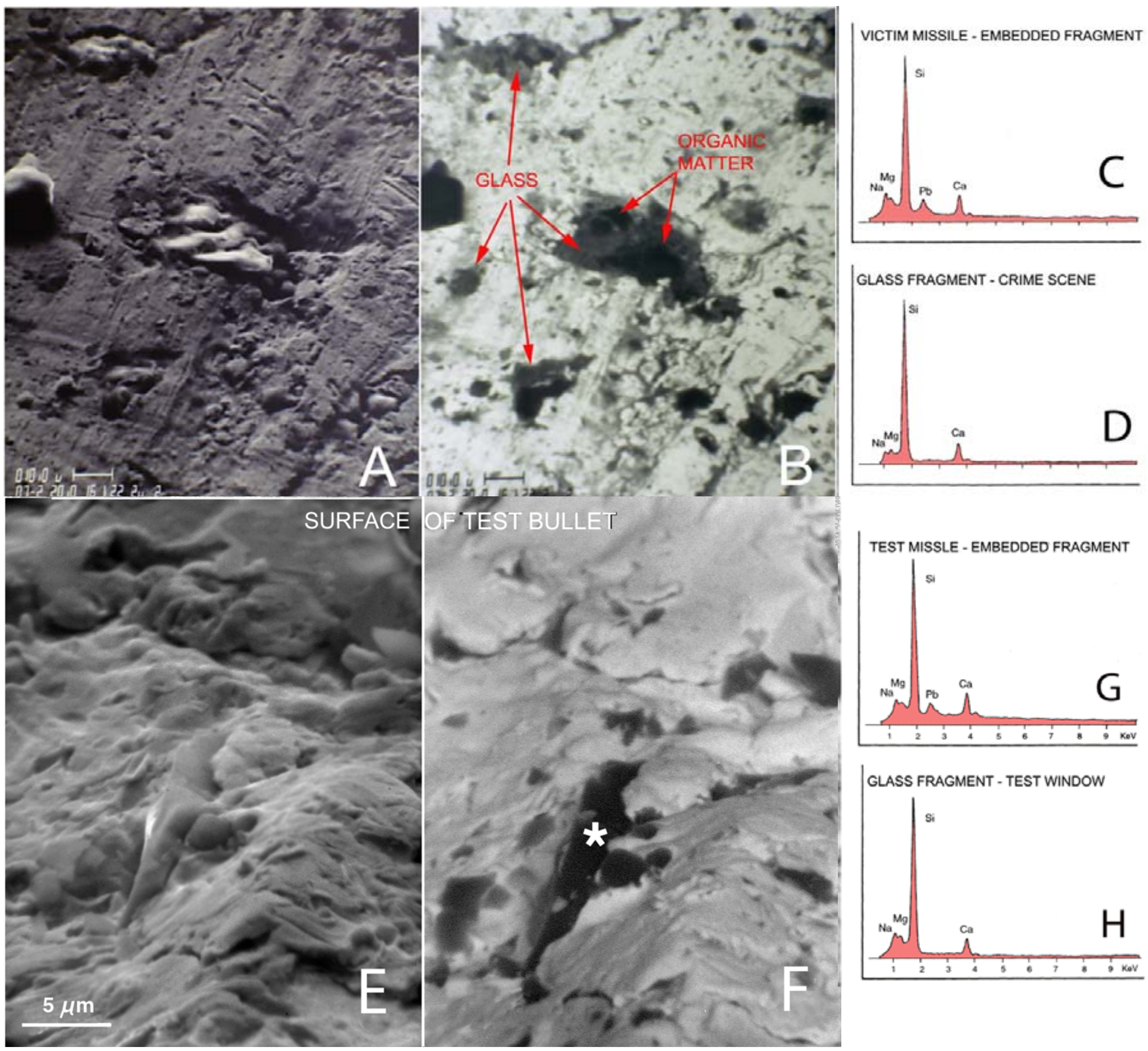

Figure 8. *Scanning electron microscopy and energy dispersive X-ray spectra of bullet surfaces. A: The surface of the scrape zone of the fatal bullet, secondary image. B: Backscatter image of the same surface in A showing locations of silicon-rich fragments (lighter dark fragments) embedded in the lead of the bullet. C: Example spectrum from one of the embedded particles. D: Spectrum of a glass fragment found at the crime scene. E: The surface of a mushroomed zone of a test bullet, secondary image. F: Backscatter image of the same surface in E showing locations of silicon-rich fragments (dark) embedded in the lead of the bullet. G: Example spectrum from one of the embedded particles in a test bullet. H: Spectrum of a glass fragment from the test bullet.*

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spectra by energy dispersive X-ray analysis (EDS). As presented in Fig. 8, apparent glass particles are embedded in the lead of the victim's bullet. The images of Fig. 6 were taken on the scrape surface of the victim's bullet. Spectra by EDS (Fig. 8A) were generated from these glass particles. A glass particle was recovered from the window in question and its elemental composition determined by EDS (Fig. 8C). Similar glass particles were embedded in the scrape area of the test bullet shown in Fig. 4B and a spectrum is shown of one of these particles (Fig. 8G). The experimental window glass elemental composition (Fig. 7H) was similar to that of the crime scene window (Fig. 7D). The spectra are quite similar between the test bullets and the fatal bullet. These glass-like particles are embedded in the lead - not only was the fatal bullet exposed to glass, but also these particles were forced into the lead of the bullet.

Regardless of the almost enigmatic features of the fatal bullet, this bullet did come through the window glass. Even without the .22 bullet interacting with at the crack of window glass, the hit and penetration of a .22 lead bullet on a window powderizes the glass (Burnett, 2001; Figs. 7A and 7B). Micron- and submicron-size size glass particles embed in .22 bullets that go through glass (e.g., Figs. 8E through 8G). The fatal bullet has embedded glass particles (Figs. 8B and 8C).

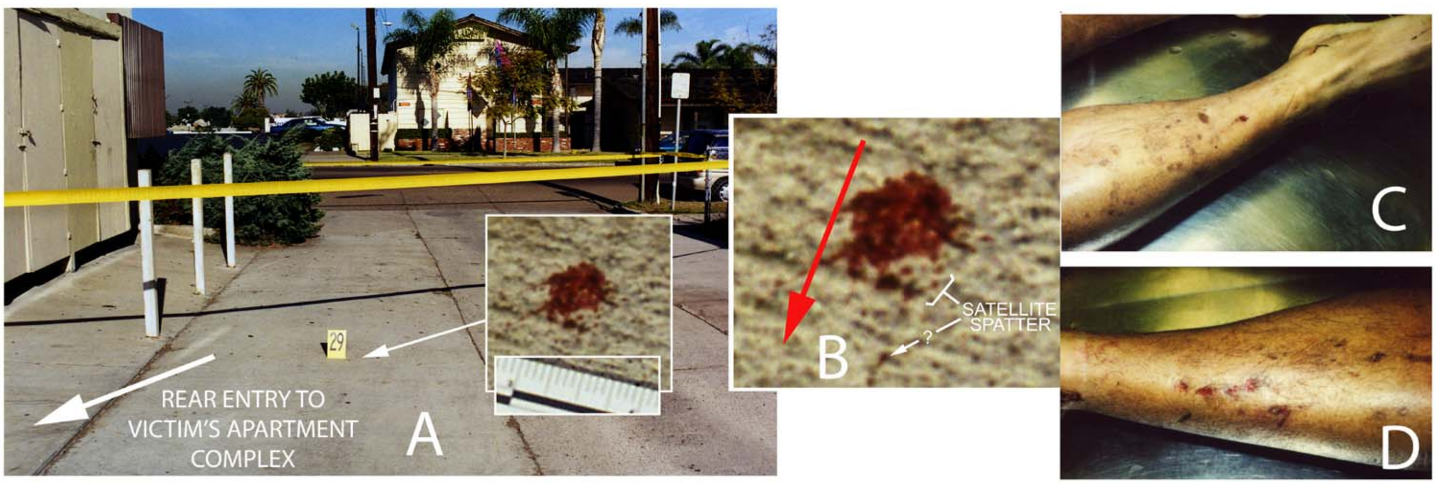

Figure 9. *A: Crime scene image of the back alley to the apartment where the shooting took place. Inset: the blood droplet that was deposited wet. B: Enlargement of the blood droplet. Satellite spatter shows the direction that the blood shedder was traveling (red arrow - towards the apartment building's rear entrance) when deposited. C & D: Autopsy images of the legs of the victim show premortem abrasions.*

The Blood Stain in the Alley. A single, small blood stain was found in the alley at the side of the apartment building where the homicide occurred (Fig. 9). This stain was identified as the victim's blood by DNA analysis (Cellmark Diagnostics, Case No. F991340). An enlargement and enhancement of the photograph of this bloodstain (Fig. 9B) shows that 1) the bloodstain was created by a wet droplet and was not a transfer. 2) The bloodstain exhibits distinct scalloped edges that indicate that it was likely shed from the source person while that person was traveling in the direction of the apartment courtyard.

The scenario presented by the prosecution as explanation for this stain was that the defendant transported the blood to this location after she shot the victim and was disposing of the .22 rifle. It was shown that the defendant had interacted with the victim in an apparent attempt to comfort him and she had his blood on her clothing. Could this blood be of sufficient wetness and volume that it would remain liquid to drop while she was allegedly returning from disposing of the rifle? Blood was found in no other location outside of the apartment.

Is it possible that the victim was at the location prior to his death and the blood droplet in the alley came directly from him? It appears likely. The autopsy report notes, “recent scratches on the hands and excoriations of shins” (Figs. 9C and 9D). The victim was wearing Bermuda-like shorts at his death. A wet droplet of that volume to create a stain that size likely came directly from the victim (see James, et. al., 2005) and was not transported by the defendant.

Gunshot Residue. Perhaps the most inculpatory evidence presented at the trials of Ms. Contreras was the finding of gunshot residue (GSR) on her hands after the shooting. At the time, this evidence seemed incontrovertible. However, the following year results of two GSR studies from the Los Angeles County Coroner’s SEM laboratory (Sandberg, et al., 2000 and Kowal, et al., 2000) were presented at conferences. These studies confirmed the work of Crowson (1996) and Burnett (1997) that GSR is found in the police environment. Suspect contamination can occur from the back of police cars, from police stations and from contact with police officers (Sandberg, et al., 2000 and Kowal, et al., 2000) .

The handling of Ms. Contreras in regard to sampling her hands for GSR was odd. The report of Patrol Officer G. Seward (Bates page # 000038):

> “ I explained to Contreras that the detectives would need to speak to her about what happened. Contreras agreed to voluntarily come down to the station to speak with the detectives. I drove Contreras to NCPD [National City Police Department]. I immediately took Contreras to a vacant interview room. ... Contreras was sitting directly across the table from me.
>
> Detective Carr provided me with two brown paper bags. I placed her left hand inside a brown paper bag and taped the bag around her wrist. I placed her right hand inside a brown paper bag and taped the bag around her wrist. … Detective Carr entered the room and conducted a gunshot residue test…. [presumably after removing the bags].”

Apparently these officers’ superior had become aware of the potential for GSR contamination of suspects while in the police environment, and instructed them on the need to paper bag suspects’ hands involved in shootings. But unfortunately these officers did not understand when suspects’ hands should be bagged. Contreras’ hands likely became contaminated with GSR before the bagging as soon as she got into the police car.

Not surprisingly, the SEM/EDS examination of the samplers from Contreras’ hands by Mr. Steven Dowell of the Los Angeles County Coroner’s Office Crime Laboratory revealed three-metal component (“unique”) GSR as well as “consistent” GSR. Mr. Dowell’s testimony will be reviewed below.

EXPERT TESTIMONY

Testimony of Gene Wolberg (San Diego Police Crime laboratory). Mr. Wolberg testified at the first trial (July 30, 1999) and a transcript of his testimony read at the following two trials.

The bullet. Mr. Wolberg examined the .22 bullet from the victim and testified that the bullet was hollow point and copper coated and probably was of Winchester manufacture. The number of lands and groves on the bullet were 16 and the twist direction was right. These data indicated that the bullet came from a Marlin manufactured rifle.

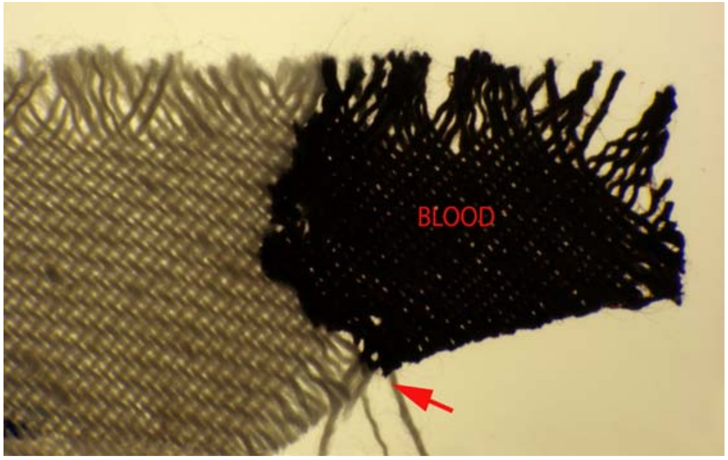

Figure 10. *Cotton fabric partially soaked with human blood. The dried bloodied area shows no shrinkage. The blood acts to cause some of the cotton fiber bundles to adhere to each other. In addition, the blood soaking "freezes" the fabric to preserve its original form. Unraveling did occur on the fabric to the bloodied area (red arrow), but was stopped at this point.*

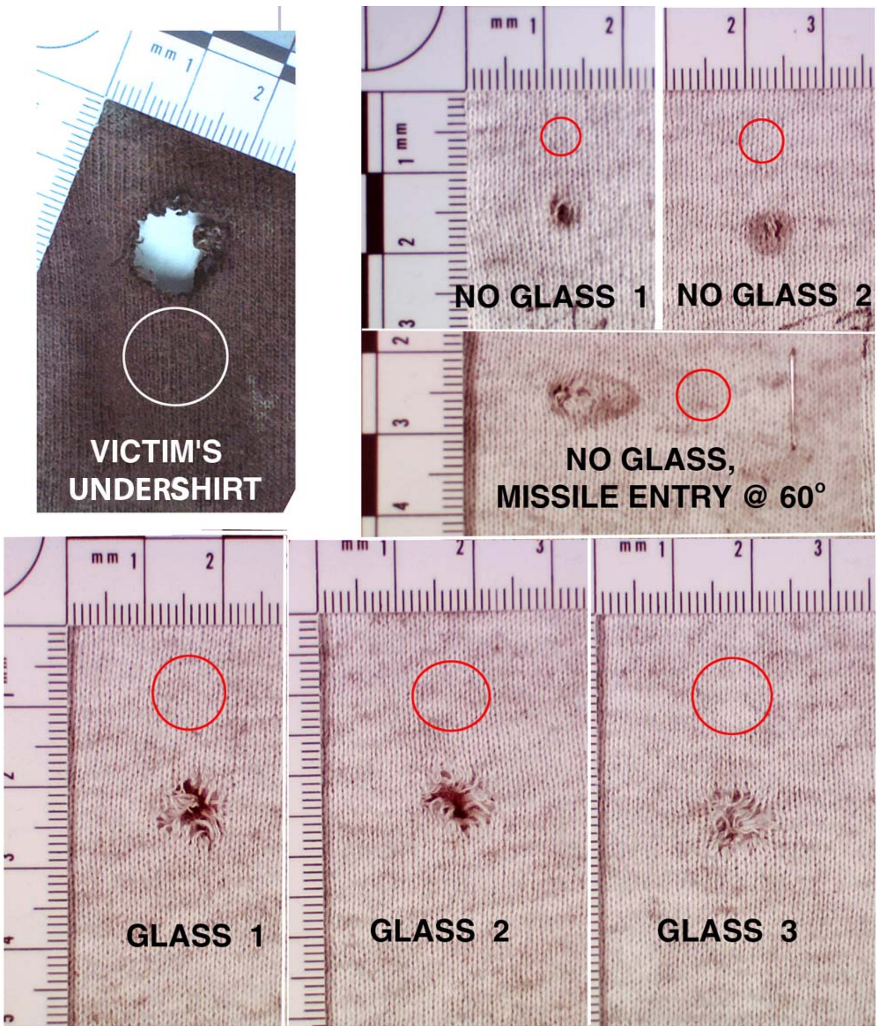

Figure 11. *The bullet hole in the victim's shirt compared to test fabric of the same type to show that the bullet hole in the victim's is more than twice as large as a hole made by a .22 bullet that has not encountered the intermediate target (window glass). The hole sizes for the test shots and the victim's undershirt are calculated based on the fiber bundle damage and indicated by the circles on each example.*

<u>Terminal ballistics of the fatal .22 bullet</u>. On page 676 of Gene Wolberg's testimony (July 30, 1999) he notes,

> "… The Vasquez bullet shows a classic mushroom shape and is typical of a bullet that undergoes deformation over a long period of time, 'time' again being three or five inch travel in skin. … If one looks at the bullet that has been fired into glass, this exhibits a very typical, very short duration pressure on the bullet. In other words, something like glass hits it, the glass for a second or microsecond does not yield, starts to deform the nose and then it breaks and no more pressure on the bullet, the bullet goes through, so it never achieves that full mushroom shape. It in fact get a very flat nose, and that's about it."

Figures 3 and 4 show the mushrooming effect of .22 bullets on glass. Granted, there are examples of "minimal" mushrooming on the glass (perhaps, for example, Fig. 3?) but with others (e.g., Fig. 4A), the mushroom is relatively prominent by any definition (even though these are "half mushrooms").*

"The bullet impacted twice, once on the nose when it entered (the body), and then the bullet rotated, tumbled, in other words, which is very common inside tissue, and struck something again and produced another shear mark, not impact mark, but shear mark, slide past something relatively hard." Wolberg goes on to say, " … something hard enough that would shear lead, which doesn't take much, quite frankly. Tissue could do that, cartilage, dense tissue could simply do that. …" (p. 370). This is simply outrageous testimony. There is no evidence either from the literature or case work that would provide support for Mr. Wolberg's hypothesis that tissue, except perhaps bone, has the density/hardness to shear a bullet like that seen with the victim's bullet. Bone impact/shearing can be eliminate from this scenario because no bone particles were observed on the questioned bullet.

According to Wolberg, the bullet, upon entering the victim's body started tumbling and the bullet scrape, that went from the base to the nose of the bullet, occurred in the body of the victim. However, lamina-like features on the bullet indicate the scrape occurred in the opposite direction (Burnett, 2003). In addition, a small area of the bullet exhibits a chatter-like feature (Figs. 6D and 6E). Chatter is often a feature of glass or diamond knife sectioning of resin blocks (for transmission electron microscopy) when the section attempted is too thick or there is vibration in the system. This apparent chatter on the bullet is supportive of glass "sectioning" of the .22 bullet.

Mr. Wolberg puts much weight, likely undue, as to the entrance wound not having a "ragged edge" as recounted by him of the autopsy report (testimony of July 30, 1999, pp.691 to 698). In the scenario that I am presenting, the bullet was tumbling when it left the window and impacted the victim, where it likely presented an aspect that did not cause a "ragged" entrance wound. Be that as it may, apparently unmentioned in trial was that the wound did have a "ragged" aspect, "The medial wound margin shows two small lacerations each measuring 1/16 inch located at the 2 o'clock and 4 o'clock positions" (Autopsy Report, Anselmo Vasquez, 98-2357, Bates page, 00289).

<u>The victim's cotton shirt</u>. Mr. Wolberg rebutted my limited testimony on the large size of the bullet entrance defect on the victim's cotton undershirt. He testified, "...the type of weave the clothing is made of will have an effect on how big or small the hole will be, whether it is blood soaked or not. Again, the drying effect will cause a change in the hole. You can have other types mechanical damage in and around the hole that will

* Interaction of the bullet in the cotton box does not contribute or contributes little to the mushrooming first induced by the bullet interaction with the glass. If the cotton of the cotton box did significantly contribute to the mushrooming of the test bullets, the "step" morphology observed in bullets (Fig. 4) would be smeared or flattened - it is not.

cause it to unravel and get bigger… that would not be a way of determining caliber."

Although Mr. Wolberg's testimony is probably correct for close bullet calibers, e.g., a 9 mm versus a .38 Special bullet, it would not apply for a .22 caliber bullet versus, for example, a 9 mm bullet hole. The .22 caliber bullet diameter is close to half the diameter of a 9 mm bullet. It is also apparent that blood soaking and drying of cotton fabric does not cause shrinkage. The changes around a bullet hole as a result of blood soaking are restricted to the adherence of free cotton fibers to each other as shown in Fig. 10. I ran a series of test shots on a similar-weave cotton as victim's undershirt (Fig. 11). A bullet hole in the victim's cotton shirt can be analyzed as to size as long as the test fabric is of the same type (100% cotton in this case) and weave. A hole in fabric, if it is the same fabric type, can be compared (Fig. 11). Either the hole in the victim's undershirt represents defect from a much larger caliber bullet, or that the .22 bullet had an expanded profile prior to hitting the victim's body. The expanded profile of the .22 bullet is consistent with the other evidence of this case.

<u>*The glass association with the questioned bullet.*</u> Wolberg claimed that the clay bullet mounting material he used for his microscopic examination of the bullet contained silicon. This was in response to my testimony of glass particles on the bullet. He stated that I was mistaking remnants of his clay bullet mounting material and for glass fragments. I asked Mr. Wolberg on three occasions to send me a sample of his bullet mounting material, without success. Upon my final request, Wolberg claimed that he had since changed his bullet mounting media and had none of the old clay left, but he "would look" (email communication, January 5, 2000).

An analysis of four oil-base clays showed no silicon. One clay type from an old (ca. mid 1950s) bullet comparison microscope did have silicon, which appeared to be from a talc component in the clay. Even with this apparent talc presence, calcium (likely as calcium carbonate) was the dominate inorganic element (Burnett, 2001). The elemental compositions of any of the clays examined had no resemblance to glass of any type (Burnett, 2001).

<u>*The issue of gunshot residue*</u>. Gene Wolberg was misinformed as to the need to protect a suspect's hands from GSR contamination in the police environment (July 30, 1999, pp. 672-673):

> Q Are you aware … of law enforcement policy of bagging hands?
> A No
> Q … Is bagging always recommended?
> A Probably not. In my opinion I would rather leave the hands exposed so they are dry, don't sweat, don't produce a lot of moisture. My advise to officers, if they wish, is to handcuff in front so they can observe the hands, but I personally wouldn't bag hands, not on live people at least.

The issue for this line of testimony is the concern for contaminating suspects with GSR while in the police environment. Mr. Wolberg's testimony suggests that he acknowledges the possibility that GSR contamination of suspects in the police environment. Later work with hand bagging shows that moisture accumulation when hands are placed within brown paper bags is not a problem (e.g., Kemmett, 2000).

<u>*Prosecution Bias*</u>. My meetings with Mr. Wolberg over the years from 1986 to 2000 he has regularly referred to defendants as "dirt bags."

In an email (September 20, 1999) to me concerning the Contreras evidence, he noted, " Like I said, she did confess to her mom in jail that she shot him. That was a conversation recorded by the jail and could not be used in court … No one made her confess to her mom. She did it on her own. No, I am not a shrink, but when someone confesses to their mom, well…" This email was received during discussion, mostly by email, of the evidence of this case. Such statements used in support of his testimony indicates to me acknowledgement of weak or bad science/testimony. Ms. Contreras' admission that she shot her boyfriend is immaterial for the work presented here. Indeed, the physical evidence shows if she did pull the trigger, she would have had to be outside the bedroom window. Certainly, confessions can be used as direction, but can we use it as a conclusion in a report or testimony?

Gene Wolberg passed away in early 2000 during the period of time of my interaction with him concerning Contreras. No one can deny that he presented to the forensic science community extraordinary expertise concerning firearms and terminal ballistics. Unfortunately for the defendant, Ms. Contreras, he provided testimony that was faulty on a number of issues.

Testimony of Steve Dowell (County of Los Angeles, Department of Coroner, Crime laboratory) Mr. Dowell, who specializes in SEM/EDS, apparently testified in all three trials of Ms. Contreras. I have the transcript for only the first trial. Presumably, his testimony was similar for the three trials.

Gunshot residue analysis. As noted earlier, GSR samplers were taken from Ms. Contreras at the police station. Her hands were not protected from GSR contamination during most of the time she was in the police environment. Mr. Dowell's analysis of the sampler from Mr. Contreras' hands showed GSR. The spectra leave no doubt that GSR contaminated her hands. By the police not bagging Ms. Contreras' hands prior to transporting her to the police station, the GSR particles found on her hands could well have come from sources other than the shooting at issue. Mr. Dowell acknowledges the multiple possible sources for GSR in this case (testimony July 28, 1999, p. 293).

Particles associated with the fatal bullet. Mr. Dowell's testimony concerning the fatal bullet is cursory at best. He stated that he found silicon-bearing particles that had additional elements of aluminum, sodium etc, and noted (July 28, 1999, p. 295), "[t]hese are normal compounds of silicon that are found on many objects and are common contaminates on many objects that are normal objects in our world." He made no attempt to do a comparison analysis of glass with the particles embedded in the lead of the bullet as I had found (Burnett, 2001). He did not provide spectra or describe where he examined the bullet in the SEM. From the testimony, it appears that he analyzed less than five particles. He goes on (p. 295-296):

> "Glass has a particular definition, and window glass in particular has a very particular definition. Only part of that definition includes its chemical composition. The definition of glass or glasses is usually made using other technology, in particular using polarized light microscopy, which is not scanning electron microscopy.
>
> So although I can find particles, determine their compositions as to whether or not the particles, silicon particles that I saw, are actually window glass, I cannot make that determination with the technology that I used."

Mr. Dowell has lost sight that forensic science is, more than any other scientific discipline, the process of comparison. That comparison may be with controls to an experiment or comparing materials from a crime scene (e.g., the window glass) to that of subject items (e.g., particles on or embedded in the fatal bullet). The identification of glass particles by such a comparison was made in this case (Burnett, 2001) and recounted here (Fig. 8). The use of a polarizing microscope as described by Mr. Dowell is not warranted in this case.

The scenario described in this paper is simple: the bullet went through window glass prior to hitting the victim. Under this scenario, the majority of inorganic particles on the fatal bullet are window-glass particles.

Are numerous particles of the same elemental composition as window glass seen associated with the bullet? The answer is yes. The bullet never had significant contact with other particles (e.g., soil) described by Mr. Dowell. However, the clay used by Mr. Wolberg to view the bullet may have contaminated the bullet, but these particles would likely be rich in calcium. It would be unlikely that aluminum-containing particles would represent a significant contribution of particles on the bullet. I do not recall seeing any when I examined the fatal bullet in the SEM.

There is no question that numerous glass particles of the same composition as the window glass from the crime scene are associated with the fatal bullet (Fig. 8). Rather than Mr. Dowell making a detailed analysis of the bullet surface and comparing the spectra with samples of window glass from the scene (glass pieces from the crime scene are in evidence in this case), he provides obfuscating, meaningless testimony based on grossly inadequate evaluation of this evidence.

Again note that no calcium phosphorus particles have been described in any analyses. Calcium phosphorus (calcium phosphate) or bone would likely have deposited on the bullet if that bullet had impacted or been scraped by bone.

Testimony of Peter D. Barnett (Forensic Science Associates, Richmond, California) Mr. Barnett was retained by the defense to evaluate the evidence for the second and third trials of Ms. Contreras. I was not retained nor did I testify or contribute in trials two and three of this case.

Mr. Barnett either ignored or was unaware of my work on this case, despite being a member (Fellow) of the American Academy of Forensic Sciences (AAFS). He receives the Journal of Forensic Science, published by the AAFS, where my article (Burnett, 2001) on this case appeared. The journal is supplied free to members. In addition, the defense attorney for the second and third trials, Mr. Allen Cazares, in a meeting at my laboratory on May 3, 2002, was provided a reprint of my article as well as a summary of the work that I have performed in relation to the Contreras case after the publication. I find it hard to believe that Mr. Barnett was unaware of my article. Did Mr. Cazares fail to mention my publication and work? And there was also my testimony at the first trial.

The testimony of Mr. Barnett at the second and third trials provided none of the work that I had published on this case, except to describe his search for "powdered glass on the surface of the bullet." Up to the time of publication of my paper, there were no published accounts of bullet interacting with window glass with the generation of powdered glass on the bullet surface. The testimony concerning powdered glass suggests that Mr. Barnett was aware of my publication.

Assuming that Mr. Barnett was aware of my work, but for some reason did not trust it, why did he not duplicate that work? Confirmation of published scientific work by other parties is the mainstay of science. Indeed, even without considering my work, part of Mr. Barnett's testimony focused on the window defect (e.g., February 3, 2003, p. 798 ff). He and Mr. Cazares were aware of the potential exculpatory value of the window defect. He was aware of the unusual form of this window defect. Barnett's broad forensic science experience indicates he knows what a window that has been hit with a bullet looks like, or at least lets hope he does. In that regard, from my standpoint, it was immediately obvious to me upon my first examination of the image of the window defect, that the defect (Figs. 1B, 1C and 1D) resembled a bullet strike on a window and the reason that defect was not fully developed was that the window had been previously cracked. That crack had stopped the full development of the bullet-window ("sun") defect (see Burnett, 2001). My research focused on this issue, as well as glass particles on the bullet (Burnett, 2001).

Mr. Barnett's examination of the bullet for evidence of glass was even more cursory than Mr. Dowell's examination. Barnett apparently made no attempt to obtain a sample of the window glass in evidence or examine the bullet surface by scanning electron microscopy.

Perhaps the weirdest aspect of Mr. Barnett's testimony regarded the order that the fatal bullet acquired defects (February 3, 2003 pp. 821-822):

> Q Now, the damage to the side of the bullet, were you able to determine if that came from the first impact or the second?
> A No, I wouldn't hazard a guess to that.
> Q Could you make a determination looking at the bullet which came first, which impact came first?
> A No, I don't think I could give an opinion about that.
> Q Why is that?
> A I just don't think it is possible.

The scrape is on the mushroomed part of the bullet. There is no question that that scrape (the "second" impact) followed the mushroom formation of the fatal bullet (Fig. 6).

Legal issue? In late 2003 I discovered that the trails of Ms. Contreras had occurred without my participation. Phone calls to Mr. Barnett as well as Mr. Cazares elicited what I would best described as patronizing responses from both. Most of the facts of this case were presented to the forensic science community by my publication (Burnett, 2001) in the Journal of Forensic Sciences, a world-renowned scientific journal. This was almost two years prior to the second trial. That article was reviewed by three scientists selected by the editor. There were no criticisms. During the years following that publication in 2001, there have been no criticisms of my paper, either in other articles or other forms (e.g., a letter to the editor). Mr. Barnett did not respond to my request (October 27, 2003) to publish his work on this case and critique Burnett (2001). Therefore, a lack of critical comment by any party, constitutes tacit acceptance that the conclusions presented in this published work stand. By the principles of both Frye and the Federal Rules of Evidence (Daubert), Burnett (2001) is foundational. In other words, in a court of law, Burnett (2001) would be considered as foundation to any testimony in this case. As such, the scientific community has acknowledged that Mr. Vasquez, the victim in this shooting, was killed by a .22 caliber shot through his bedroom window by an unknown party. The prosecution's theory of this case did not have Ms. Contreras shooting her boyfriend from outside the bedroom window.*

* As stated, this is a lay opinion. If you are an attorney and have an opinion as to this "legal issue," I would like to hear from you. I have heard from a law professor who stated, after reading this paper, "I think the determination that it becomes fact is too strong, but there may be an appealable issue." Your statement will be posted anonymously, unless you agree to your name being posted.

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