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MSL

ACADEMIC ENDEAVORS



Jim Wentzel Report

CORONER
Elizabeth K. Balraj, M.D.

**Cuyahoga County Coroner's Office
Photography Department**

REPORT OF FINDINGS

Under the direction of Dr. Elizabeth K. Balraj, Cuyahoga County Coroner, I was requested to independently examine photographs, testimony and documents related to the death of Marilyn Reese Sheppard (Cuyahoga County Coroner's Case Number 76629) to determine if any new, relevant, information could be gathered using current technologies and methodologies. After a preliminary review of the case and consultation with Dr. Balraj, I directed my attention to the following specific areas for further analysis and experimentation:

1. The scar on the wrist of Richard Eberling.
2. Computer analysis of the crime scene photographs for the purpose of bloodstain analysis.
3. The wristwatch worn by Dr. Samuel Sheppard.
4. The possible source of the blood "trail" through the Sheppard home.
- ✓ 5. The "weapon" imprint found on the pillow of Marilyn Sheppard's bed.

Portions of, or the entire contents of, the following materials were reviewed in preparation of this report.

- Film negatives, positives, and photographic prints related to Cuyahoga County Coroner's Case Number 76629 currently archived in the Photography Department.
- A transcript of an interview with Dr. Samuel Sheppard at Bay View Hospital dated July 8, 1954.
- A transcript of an interview with Dr. Samuel Sheppard by the Cuyahoga County Sheriff's Office dated July 10, 1954
- The expert opinion of Michael N. Sobel, D.M.D., consultant in Forensic Odontology, not dated.



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- A report of findings from the Trace Evidence Department of the Cuyahoga County Coroner's Office, not dated.
- A report titled "Laboratory Findings" from the Cuyahoga County Coroner's Office, not dated.
- A transcript of the testimony (direct examination) of Dr. Paul L. Kirk, 1966.
- The expert opinion of Cyril H. Wecht, M.D., J.D., consultant in Forensic Pathology, dated July 29, 1999.
- The expert opinion of Emanuel Tanay, M.D., P.C., consultant in Forensic Psychiatry, dated July 30, 1999.
- The expert opinion of Mr. Barton P. Epstein, consultant in Forensic Serology & Microscopy, dated June 18, 1999.
- A transcript of the testimony (direct and cross-examination) of Mary Cowan, 1954.
- A transcript of the testimony (direct and cross-examination) of Mary Cowan, 1966.
- The Affidavit of Paul Leland Kirk, Court of Common Pleas, No. 64571.
- A transcript of the testimony and proceedings taken at the Coroner's Inquest, dated July 22, 1954.
- A report, dated October 1966, describing the stereomicroscopic examination of the wristwatch (State's Exhibit 26A) belonging to Samuel H. Sheppard.
- A VHS videotape recording of a broadcast episode of NOVA regarding the murder of Marilyn Sheppard.
- Two 3 1/2 X 4 15/16 inch photographic prints of the scar on the wrist of Richard Eberling taken at the time of his autopsy.



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1. Scar on the Wrist of Richard Eberling

The expert opinion of Forensic Odontologist Michael N. Sobel, D.M.D. concludes, in part, by stating that

"While defending in this manner, she attempted to grasp the wrist of the attacker's left arm with her left hand, gouging the attacker's left wrist with the fingernail of her 4th finger left hand."

Dr. Sobel further describes photographs of a small scar on the inside of the left wrist of Richard Eberling (first described in 1959) and links the scar to Marilyn Sheppard by asserting:

"These observations fit the plausible theory relating to events at the time of Marilyn Sheppard's attack, and are consistent within reasonable scientific certainty to observations of similar longitudinal fingernail marks I have seen in other like cases."

Although it does not seem to be known if the scar was present on Mr. Eberling's wrist in 1954, I reviewed photographs of Mrs. Sheppard's hand taken at the time of her autopsy and photographs taken of Richard Eberling's wrist at the time of his autopsy. This examination was conducted in order to determine if a comparison of Richard Eberling's scar and Marilyn Sheppard's fingernail were possible.

Examination of the two photographic prints taken during Mr. Eberling's autopsy reveal that both prints contain an ABFO (American Board of Forensic Odontology) No. 2 scale designed for use with photographs of bite marks, however, the scale has not been used as intended. Additionally, both prints have very little depth of field (indicating a relatively large aperture), appear to have been taken with available light, and the scar is out of focus in both photographs.

In an effort to improve the quality of the photographs, both prints were digitized and analyzed using Adobe Photoshop 5.0.2. After correcting the perspective of both prints, the visual information contained in various color channels (R, G, B, C, M, Y, and K) was reviewed. It was determined that most of the visual information related to the scar was contained in the blue and green channels. New images were created using the information contained in these two channels and contrast between the scar and the surrounding skin was improved by creating new tonal range curves. Finally, the images were sharpened before printing. Unfortunately, the scar appears as two different shapes and the photographs are not particularly usable.

Proper methodology for the visual comparison of two items (e.g., shoes and a shoe imprint, tires and a tire track, or teeth and a bite mark) that may, or may not be related requires that both items be photographed with a ruler or scale. Both items are then printed in the same scale with one of items usually printed on film or transparency material. This allows the examiner to see the



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similarities and/or differences of the two subjects simultaneously. A review of photographs taken of Marilyn Sheppard's hand and, in particular, her fingernail, reveal that no rulers or scales are present in any of the autopsy photographs.

In conclusion:

- The two autopsy photographs of Richard Eberling's scar are of poor quality and seem to conflict with one another.
- The autopsy photographs of Marilyn Sheppard's hand are lacking a ruler or scale.
- No scientific, repeatable comparison of the two subjects is possible.

2. Computer Analysis of the Crime Scene Photographs for the Purpose of Bloodstain Pattern Interpretation

In the episode of NOVA regarding the murder of Marilyn Sheppard, Mr. Barton P. Epstein is filmed assisting in the recreation of the Sheppard bedroom after Mrs. Sheppard's death. Mr. Epstein is shown examining a photograph with a loupe and then painstakingly painting bloodstains on a vertical surface. Mr. Epstein is, in fact, recorded looking at a photograph and then, without reviewing the photograph, painting two bloodstains. No ruler is present in this scene. The accuracy of this reconstruction completely relies upon Mr. Epstein's artistic ability and his capacity to examine an 8 x 10 inch photographic print and perform the necessary perspective and scale calculations required to recreate the visual information "life-sized". Finally, upon the completion of his rendition, Mr. Epstein is filmed causing blood spatter with a flashlight and then comparing the results of his experiment to his painted interpretation of the scene photographs.

Mr. Epstein states in his report:

"It should be noted that blood spatter reconstruction from photographs is often limited compared to working with the actual crime scene or articles or evidence."

It is possible, using current digital imaging technology, to produce detailed dimensions and positions of individual bloodstains from photographs taken of the Marilyn Sheppard crime scene if some conditions are met:

- All photographs to be analyzed must contain the same scale or ruler.



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- One photograph must contain the ruler photographed “straight-on” with the focal axis of the lens perpendicular to the surface being photographed.
- Photographs to be analyzed must be properly exposed so that there are significant differences in value (brightness) between individual bloodstains and the surrounding surface.
- Prints or film positives or negatives must have minimal grain.

Many of the photographs taken by Dr. Paul L. Kirk meet these criteria and at least one photograph taken by Paul Kirk contains a ruler that was photographed “straight-on”. Thus, I was able to digitize and analyze several of the photographs of the crime scene taken by Dr. Kirk. Several of the photographs of the crime scene taken by Dr. Kirk using both Adobe Photoshop 5.0.2 and ImagePro Plus.

After scanning, images were corrected for perspective using Photoshop and information regarding the ruler obtained from the “straight-on” shot. Once corrected for perspective, each image required that new tonal range curve was created in order to maximize the brightness difference between blood and the surrounding vertical surface.

Upon completion of curve adjustments, the images were then opened in ImagePro Plus for object measuring and counting. The lengths of the major and minor axes and the angle of the major axis were all stored for each photograph that was analyzed. Assuming that one records or stores a copy of the original scanned image, the tonal range curve, the area of interest, and the threshold value of each image being analyzed, this process can be repeated. The numeric information gathered from a single photograph is as valuable toward analyzing and interpreting bloodstains as pages of measurements that are manually taken at a crime scene.

In conclusion:

- The methodology used by Barton P. Epstein (in the NOVA program) for reconstructing bloodstains evidence for analysis is not repeatable and is not scientific in approach.
- It is both possible and repeatable using modern imaging technology to extract useful numerical bloodstain data from 45-year-old photographs of the Sheppard murder scene.



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3. The Wristwatch Worn by Dr. Samuel Sheppard

Much discussion and experimentation has taken place regarding the wristwatch worn by Dr. Samuel Sheppard at the time of Marilyn Sheppard's murder. Both Mary Cowan and Dr. Paul Kirk agreed that Dr. Sheppard's watch was not submerged in Lake Erie or in any other water. However, the nature of bloodstains found on the wristwatch and the circumstances in which they might have been deposited warrant further consideration.

According to various statements by Dr. Sheppard, he was knocked unconscious upon reaching Marilyn Sheppard's bedroom. When he regained consciousness, he noticed his wallet on the floor and at this time his watch was still apparently on his wrist. Dr. Sheppard's wristwatch was apparently removed after the struggle on the beach. In Mary Cowan's report following the incident, the condition of the watch was noted as not containing sand or any signs of being in the lake, the band was broken, and there were many bloodstains contained on the surface of the watch crystal and on the links.

In order to review the bloodstains noted in Mary Cowan's report, a composite image was created using photographs of the links that were taken in 1966. This image was assembled in Adobe Photoshop 5.0.2 using scanned film negatives. This composite was developed at maximum optical resolution in order to accurately measure the very small bloodstains found in the grooves of the watchband. All calibration and measuring was performed using ImagePro Plus.

As was noted by Mary Cowan there were many areas of "red-brown crusts" that suggested the outlines of larger bloodstains or smaller circular and elliptical crusts that lacked blood in the centers. There were, however, numerous small (<2mm) symmetrical stains (elliptical or circular). These bloodstains are not consistent in size or shape with smears, swipes, or other patterns one might expect if Dr. Sheppard had indeed checked his wife's pulse. Additionally, there are not larger bloodstains near these small symmetrical stains indicating that these small bloodstains are not satellite-type bloodstains.

Reference literature indicates that bloodstains of this size and shape are consistent with high-velocity bloodstains (different from bloodstains resulting from a high-velocity injury). Additionally, bloodstains of this size and shape have very little mass and will not travel for more than 2-3 feet.

In conclusion:



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- A high-resolution composite image of Dr. Samuel Sheppard's entire wristwatch can be assembled, studied and measured using current digital imaging technology.
- Many of the bloodstains measured on the Dr. Samuel Sheppard's wristwatch are consistent in size and shape with high velocity bloodstains.
- If the bloodstains measured on the wristwatch belonging to Samuel Sheppard are indeed of the high velocity nature, the wristwatch was in close proximity (< 3 feet) to the source of the blood during Marilyn Sheppard's murder.

4. The Source of the Blood "Trail" Through the Sheppard Home

There seems to be agreement among various experts that the source of the blood "trail" through the Sheppard home could not have resulted from blood dripping off of a weapon. This argument appears to have more to do with the *number* of bloodstains than with the *size and shape* of the bloodstains observed at the crime scene. Indeed, on the NOVA episode, Mr. Barton P. Epstein walked down a mock-up of the Sheppard staircase with what appeared to be a blood-soaked screwdriver and ran out of blood drops well before he got to the bottom of the stairs.

An independent experiment conducted at the Cuyahoga County Coroner's Office, and using Mr. Epstein's NOVA methodology and CHAN NEL LOCK® pliers seemed to confirm these findings as only 17 measurable (> 2mm) drops of blood were shed descending a stairwell.

However, when a "weapon" with more surface area and complexity of form was used instead of the pliers, there were a resultant 123 measurable (> 2 mm) drops of blood shed during the time required to quickly (while still walking) descend 103 steps. It is important to note that many of the bloodstains were within the ranges of sizes observed at the home of Dr. and Mrs. Sheppard.

When attempts were made to recreate Mr. Epstein's demonstration of bleeding from an open wound using a disposable bulb and pipette, the size and shape of the stains were not consistent with those measured at the crime scene.

Additionally, some discussion about an open wound as the source of the blood trail is relevant. If indeed, the source of the blood was from an injury to the wrist of Marilyn Sheppard's attacker and this injury did indeed result in "copious bleeding" (as stated by Dr. Sobel), then one would expect to see evidence of this blood on the papers in the open drawers in the office. Another notable item that lacks evidence of the attacker's blood is the green bag that contained Dr. Sheppard's wristwatch, ring and some charms.

In conclusion:



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- The size and shape of an item coated in blood dictates the number of blood drops that will be shed from it while being carried down (or up) stairs.
- A blood-covered object or weapon cannot be ruled out as a possible source of the blood trail.

5. The "Weapon" Imprint on the Pillowcase

The pillow located at the top of Marilyn Sheppard's bed is perhaps the most discussed item from the murder scene. Of particular interest is the pattern observed on the underside (in its final position) of the pillow. Dr. Gerber was convinced that this pattern was the result of a medical instrument (the murder weapon). Others have concluded that this pattern was the result of a fold or random folds.

Close examination of this pattern reveals that this pattern or imprint is "blood-on-blood" in nature. Either blood has been reapplied to an already bloody surface, or blood has somehow collected in a very geometric manner through the process of random folds. If the pattern is a result of a single fold, the larger soaking stain upon which this pattern is found was created at a different time. The soaking stain is not symmetrical, and if it were considered to be symmetrical, it is not symmetrical along the same axis as the observed pattern.

Mr. Epstein notes:

"Blood spatters on the top side of the pillow indicate that the pillow was in the position found when the blood spattering blows were delivered to Marilyn Sheppard's head."

I would agree that the position of the pillow when found was the final position of the pillow. This is demonstrated by the fact that some of the bloodstains found on the top of the pillow are deposited across folds.

Numerous experiments were conducted with blood on pillows in an effort to reproduce the appearance of this rather unusual stain. It was not possible to produce a pattern with this distinct "blood-on-blood" appearance by folding pillows on themselves with or without a bloody object inside.

It was, however, possible to reproduce a pattern with similar visual characteristics as those noted on the pillow in question. These characteristics include sharp edges defining the pattern and notably denser, darker blood in the areas of the pattern (blood-on-blood).



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Success at recreating this appearance was achieved only if the larger, soaking-type bloodstain was first allowed to dry to the touch. If an object covered with liquid blood is then placed on the relatively dry bloodstain, a pattern with the same qualities as the one observed in this case is attained. **Drying times for the experimental models exceed two hours for a 10 ml soaking-type bloodstain.**

There is evidence to support the argument that this is precisely the manner in which this pattern was formed. When one reviews the photographs of Marilyn Sheppard's bed before and after the pillow is removed, one will notice an absence of blood on the bed sheet below the pillow once it has been removed. Experiments demonstrate that even if the pillow is allowed **to dry for more than an hour, once flipped (as it is in its final resting position), blood is still transferred to the bed sheet.**

The results of these experiments indicate that the pillow was moved at the scene of the crime two hours after blood was first deposited on it.

A variety of objects were used in an attempt to create a pattern similar to the one observed. An item was not discovered that could create the observed pattern, but some observations are worth noting about items that failed to produce patterns of the same visual quality as those observed on Mrs. Sheppard's pillow. Blood seemed to form a film and cling to items made of **stainless steel** rather than transfer to the pillowcase. A **flashlight could not** have produced this pattern. Finally, this pattern is not an outline of an object, but rather is **the form of the surface that came in contact with the pillow.**

In conclusion:

- This pattern is not the result of random folds.
- A pattern of this nature is the result of wet blood on an object being transferred to an area of dried blood. Experimental models require that 10 ml of blood dry for a period of time greater than two hours.
- The soaking-type bloodstain on the pillow in question was dry when it was inverted and placed in its final resting position due to the lack of transfer to the bed sheet.
- **The pillow was flipped after an extended period of time.** Experimental models indicate that **the time exceeds one hour.**



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- No similar pattern was produced by the vintage flashlight (1950's) used in this experimental model.
- An instrument with a smooth stainless steel type finish is not the likely source of this pattern.
- The item that created this pattern is still of unknown origin.

Respectfully submitted,

James T. Wentzel
December 27, 1999