

## CASE REPORT

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### Moves of Murder

**REFERENCE:** Ballou, S. M., "Moves of Murder," *Journal of Forensic Sciences*, JFSCA, Vol. 40, No. 4, July 1995, pp. 675–680.

**ABSTRACT:** A missing person report was filed with the local Police Department. In the ensuing days it became apparent this was not just a missing person case when a bloody pillow and pillowcase were recovered from a wooded area not far from the missing woman's home. Careful examination of the pillowcase revealed fragments of a bloody fingerprint and bloody patterns that seemed to indicate the type of weapon used. A thorough search of the woman's bedroom resulted in the recovery of three small blood stains, a wig fiber and a head hair. Although the body of the victim was not recovered during the investigation, the evidence collected and techniques used by the forensic investigators resulted in a guilty plea to second degree murder.

**KEYWORDS:** forensic science, blood, amido black, latent, RFLP, luminol, hair, fibers, wig, fingerprints

On October 19, 1992 the area police station received a report of a missing woman. Neighbors reported they had witnessed a female wearing pants, trench coat and hat leaving the missing woman's house the morning of October 19th, who proceeded to walk down the street. The neighbors thought this odd but assumed she was taking the Metro (mass transit) that day instead of driving her car. The woman never arrived at work. A flurry of speculation developed during the next five days when a bloody pillow and pillowcase that were recovered from a wooded area not far from her home changed the direction of the investigation (Fig. 1).

The fabric and design of the pillowcase matched remaining linens located in the woman's bedroom. There was no indication of any disturbance in any of the rooms when the initial detectives arrived. Her bedroom was relatively cluttered with clothing and pillows, and dust was present on the floor. Personal items on the top of the dresser, nightstand and desk were undisturbed. The only fact that provoked questions was the missing fitted sheet and mattress pad from the woman's bed. This initiated a thorough search and examination of the woman's bedroom. Using tweezers, a number of hairs and fibers were retrieved from the bedroom. Visual scanning of the walls and ceiling gave no indication that any type of scrubbing or cleaning had recently occurred. A detailed, deliberate search of the mattress revealed three small circular stains at the head of the mattress and a narrow long stain on the right

seam edge. The stains had a fresh appearance with a cherry red color, unlike the typical brown or rust color associated with blood that had been deposited for a long period of time. The stains were also true to their shape, with no distortion or fading to indicate that washing had been attempted. These stains were collected and preparation commenced using the sodium borate version of the luminol test [1].

The luminol test is appropriate for a determination of invisible blood stain patterns on large areas, in order to assist in determining exactly how the crime took place. Nothing was revealed when the floor and furniture of the bedroom were sprayed, but when the mattress was targeted with the luminol reagent numerous long streaks appeared. The luminescence was concentrated across the top and along the right side of the mattress, concluding with a pattern at the end of the mattress identical to the imprint of three fingers. The majority of the stains luminesced for approximately 10 seconds. Repeated spraying allowed the most intense part of the stains to be photographed with Kodak TMax 3200 black and white film. A photo scale was provided by targets of six inch square tiles of black plexiglass with fluorescent tape [2]. The targets in this manner, allowed the daylight photograph to correspond to the subsequent photographs of the luminol reaction in the dark. The brief luminescent time for the stains was consistent with fresh blood as well as with very faint blood stains [3]. Both limitations corresponded to the developing case scenario.

Although the luminol test is a relatively simple procedure and



FIG. 1—Recovered pillow and pillowcase that initiated the investigation.

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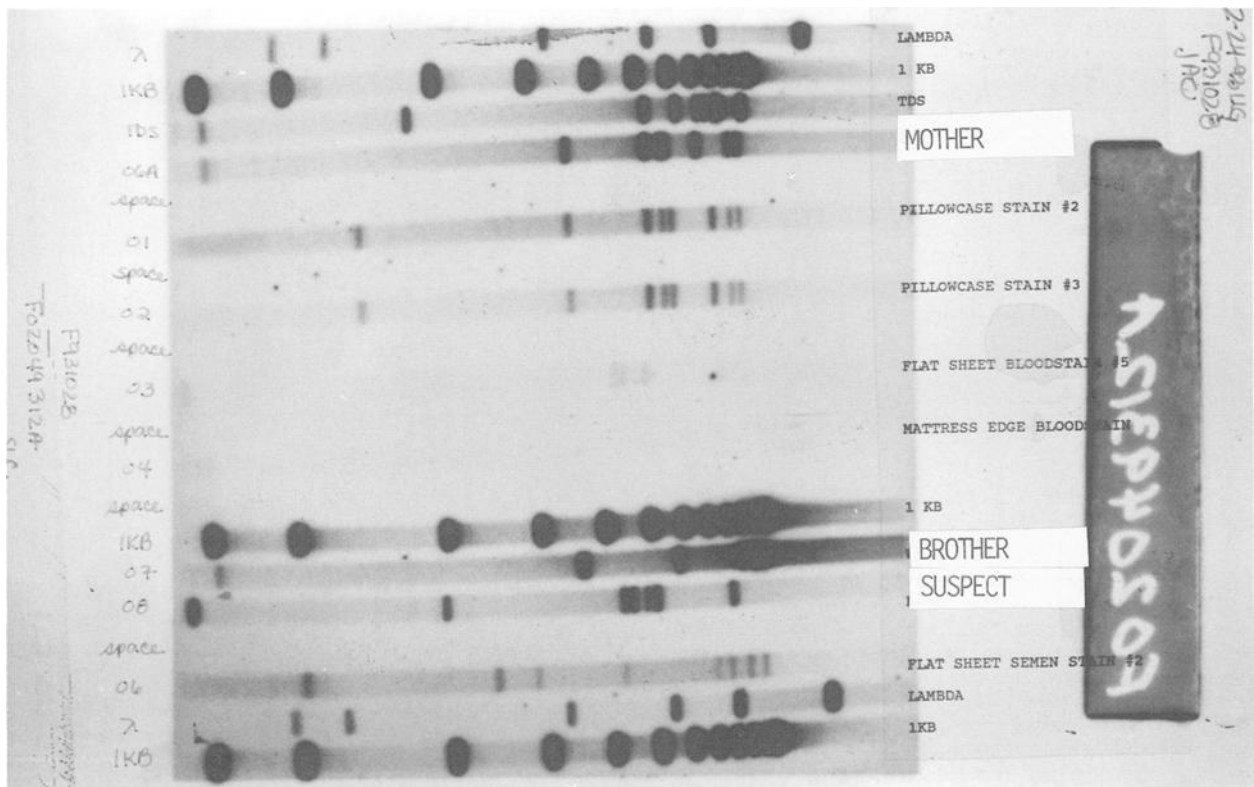


FIG. 2—RFLP Autorad comparing blood from the pillowcase stains to the missing woman's mother, brother and suspect.

several good articles exist on the application of the test there is no substitute for first hand experience. As with other chemical color tests in forensics, a documented false positive does not always concur with the actual visual color or intensity obtained with the real substance. Testing with bleach and other false positives in the crime laboratory have given guidelines for the interpretations of results in the field. Bleach will give luminescence but the intensity and color can differ from blood. Tests conducted with bleach have shown that a concentrated sample, a 1:10 dilution, and a very dilute sample (equivalent to that used in the household laundry) will luminesce for an extended period of time. This is an important fact when considering the short luminescence time for relatively fresh blood. The reaction time on fresh or diluted blood can be extended by repeated spraying or with an HCL pretreatment spray, but care must be taken to prevent oversaturation that may dilute or obliterate the blood stain pattern. Since luminol is a presumptive test, once photo-documentation has been completed, the luminescent area should be rubbed with a sterile cotton swab or removed by cutting. This will afford subsequent confirmation of the presence of blood through other scientific methods. The combination color test of tetramethyl benzidine and phenolphthalin work well even on swabs that are saturated with luminol [4].

A continuation of the luminol test throughout the house uncovered no additional stains to indicate the direction the perpetrator took. However, when a police tracking dog was given the scent at the location of the recovered bloody pillow and pillowcase, the animal led its handler to the back door of the missing woman's house.

The detectives in charge of the investigation identified a suspect within several days of the filed report. Nervous behavior, crying fits, and strange accounting of his time made the part-time gardener an obvious suspect. Obtaining search warrants the detectives discovered startling information that their suspect had made his move

days prior to the woman's disappearance. A receipt from a local hardware store listed a purchase of three rolls of duct tape, braided rope and mason line paid from his personal checking account with the woman's name written in the memo space on the face of the check. On the first day of her disappearance he had purchased a white, queen-size fitted sheet from a department store, in a size too large to fit any of his mattresses, but just right to replace the one missing from her bed. During the next few days he visited two of his rental storage lockers several times. One of the lockers was located in a state approximately 450 miles away. In another state near this storage locker, his grandparents graves were located. He was identified by the caretaker as having just visited the site. Oddly enough, the ground near the grandparents' graves had just recently been disturbed. The detectives digging at this location found no indication that blood had seeped into the surrounding sandy soil and, no fragments of clothing, tissue or hair were uncovered. Yet, several feet away from this site, as if just dropped, a mass of what appeared to be human hair was found.

During the early stages of the investigation the missing woman's mother was able to offer pertinent information of the relationship between the family and the part-time gardener. The mother informed the investigators that since the gardener's home consisted of a campsite and the bed of his pickup truck, a key to their house was made available to him for easy access to indoor amenities. Having a key to the house afforded him not only the means by which to enter the house, but the layout of the house interior. He was also included in some of the family discussions which accounted for his knowledge of much of the family's routines. Although this information sounded highly suggestive, there was no direct evidence that physically linked him to the woman's disappearance.

In the laboratory, testing procedures began on submitted blood stains, and through the Ouchterlony technique they were determined to be human [5,6]. Due to size limitations the mattress

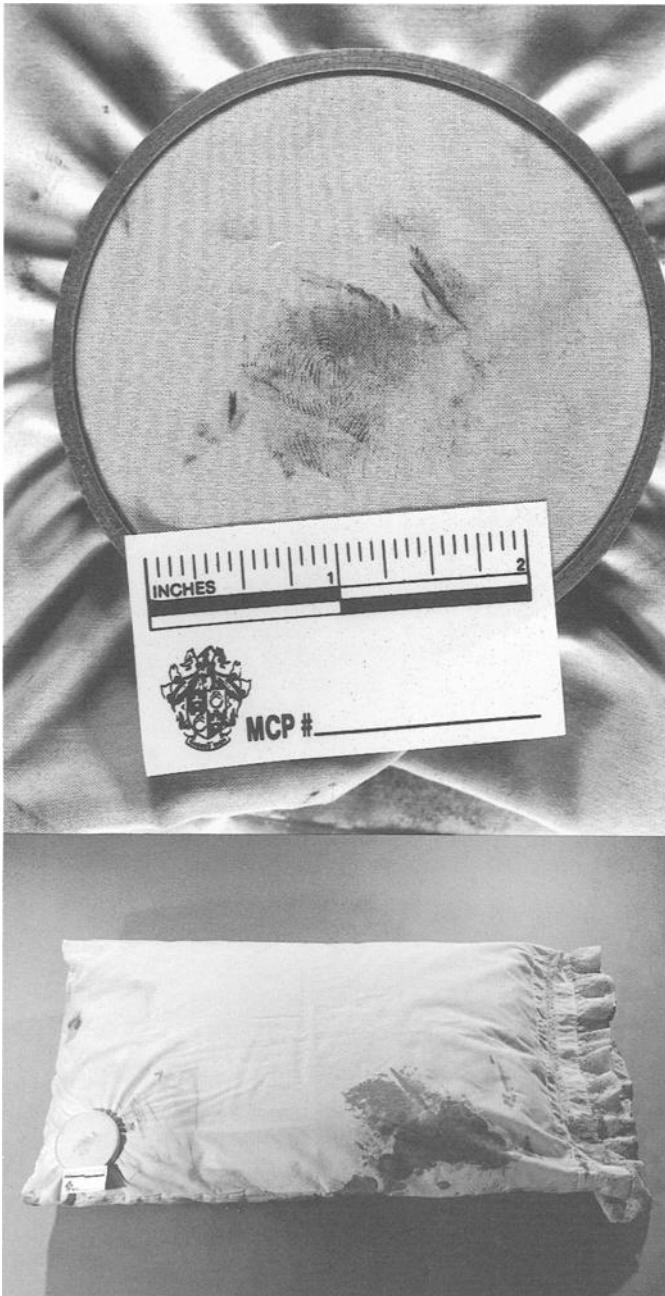


FIG. 3—Enhanced fingerprint (A) found on the pillowcase (B).

stains were only subjected to selected enzyme typing and then preserved for Restriction Fragment Length Polymorphism.<sup>2</sup> The blood on the pillowcase was identified as type A using the absorption-elution technique and confirmed via the Lattes crust test [7,8]. This was consistent with the missing woman's blood type through information received from the local Red Cross chapter where she routinely donated blood. With no known samples to reference, paper information, as well as blood samples from immediate family members, had to be accessed. Additional serology tests showed that the blood on the pillowcase was consistent with her family. This was confirmed by subjecting the remaining portions of the stains to RFLP profiling. The laboratory conducting the profiling

<sup>2</sup> DNA profiling was conducted by Cellmark Diagnostics, 20271 Goldenrod Lane, Germantown, MD 20876.

utilized the multiple probe mixture, MS1, MS31, MS43 and g3, commonly known as a "cocktail mixture." The resulting eight band pattern on the autoradiogram showed the genetic conformity between the pillowcase blood and the blood from the missing woman's mother and brother (Fig. 2).

Generally, once the stain size on an item or garment is noted, recorded and removed for testing, the item is packaged and released for storage. However, the location where the pillow and pillowcase were found and the number of varied blood stains present was intriguing. The next few days were spent subjecting the pillowcase to various light sources, re-marking folds and scrutinizing each faint detail. Hidden in a corner of the pillowcase was discovered ridge patterns in blood. This proved to be a portion of a print, visible but insufficient in points for identification. A protein stain, Amido Black, was used to enhance the print [9]. Once the print was developed the fabric was stretched around the print using a small embroidery hoop (Fig. 3). The print was then photographed using two types of film. The first film, Ilford black and white, is not a unique film but it's wide range of grey hues offers a discerning tool when working with fine detail. The second film, Ortho high contrast film, brought up the texture of the fabric, eliminating any question that the print was due to the weave pattern of the pillowcase. The photographs of the latent print were then sent to the county police Regional Automated Fingerprint Identification System where two examiners identified the latent print as the part-time gardener.

This was thought to be the needed link in the investigation. However, his attorneys explained that since he lived out of his truck and parked in a nearby parking lot, he routinely walked through the woods where the pillow and pillowcase were found. He would occasionally pick discarded items up to see if they were usable and drop them if they were not and obviously this is what must have occurred with the pillow and pillowcase (Fig. 4).

Following the examination of the pillowcase, attention was shifted to the pillow itself. Marks in blood that demonstrated a front and back wiping of a sharp object were noted. Examination determined that the width of the outline was too narrow and the length of each mark too exact to one another for them to have been made by random wiping. All types of possible weapons from the part-time gardener's campsite and storage facilities were submitted for comparison. None of the weapons examined could be matched up to the pattern found on the pillow.

Of the remaining physical evidence submitted to the crime laboratory, the majority proved of little value in establishing a link between the gardener and the disappearance of the woman. Blood stains that were found on items taken from his campsite were unsuitable for determining if they were even human blood. Other stains found on bed linens from his truck bed were identified through RFLP profiling as being his blood. Such results continued for the next several months and still the woman had not been located.

Only six weeks remained until the trial date and hair examinations had yet to be conducted. The known samples of the woman's head hair were recovered from the two hair brushes she had on her dresser and from a brush removed from the glove compartment of her car. Gross examination showed the hairs from each brush to be consistent with one another, therefore out of the 90 hairs removed from the brushes, 30 were measured and mounted. The known pulled head hairs from the part-time gardener were prepared in the same fashion. Prior to comparison with the questioned hairs, the known hair samples were examined using a Leitz comparison microscope to note internal characteristics [10-12]. During this exam, a peculiarity in the sample of the woman's hair was discov-



FIG. 4—Relation of pillow and pillowcase recovery to the missing woman's home and locations known to the suspect.

ered. One of her mounted head hairs was in fact a wig fiber (Fig. 5). This wig fiber had been recovered from one of the two hair brushes found on top of her dresser. Microscopic examination of the remaining mounted hairs, the additional known hairs and the large number of questioned hairs recovered from the house interior revealed no additional synthetic wig fibers.

The detectives' subsequent inquiries provided these facts. No one in the missing woman's family or her close friends owned or

wore wigs and she never wore dress pants to work. These details now cast doubt as to the identity of the individual leaving the house that Monday morning. A search of the part-time gardener's local rental facility produced a hat, trench coat, pants and 24 wigs and wiglets. All of the wigs and wiglets were submitted to the crime laboratory for comparison with the one wig fiber, and the majority of the wigs and wiglets were eliminated by gross examination. A microscopic examination revealed one wig, by a major manufacturer, did exhibit all of the same internal characteristics as the wig fiber (Fig. 6) [13,14]. The wig fiber and the selected wig were transported to the Hairs and Fibers Unit of the F.B.I. Laboratory in Washington, D.C.<sup>3</sup> The fibers were then subjected to the same preliminary microscopic comparisons followed by composition identification utilizing the FT-IR with microscope attachment. At this point the composition of the fiber and the wig itself were identified as modified acrylonitrile. One additional exam was conducted utilizing an instrument known for its sensitivity, the Zeiss MPM-400 microspectrophotometer. This instrument using the UV-Visible range of 380 nm–770 nm has the capability to discern between the 7000 commercial dyes that are used in the United States. Each dye is trademarked by the company that formulated it to avoid duplication by other manufacturers. Subjecting the fiber to this examination produced a spectral fingerprint of the dye, matching it specifically to the fingerprint of fibers from the selected wig (Fig. 7).

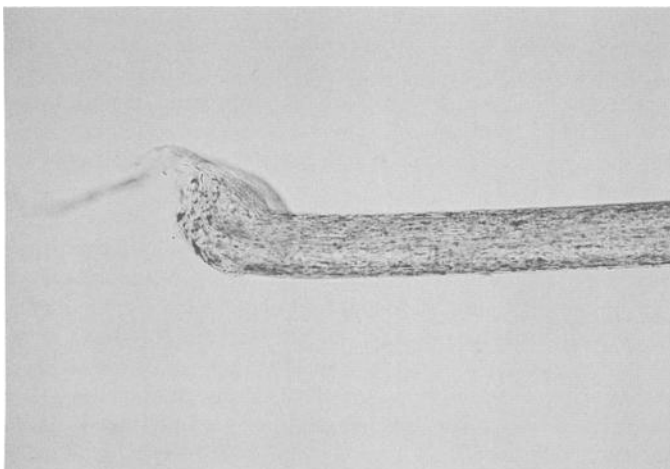


FIG. 5—Recovered wig fiber from the missing woman's hair brush.

<sup>3</sup>Fiber analysis was conducted by Special Agent Michael P. Malone, Supervisor of the Hairs and Fibers Unit of the FBI Laboratory, Washington, DC.



FIG. 6—Of the 24 wigs and wiglets recovered from the suspect's storage facility, this wig matched the single wig fiber.

Meanwhile, the tedious task of comparing the vast number of questioned hairs to the known samples from the part-time gardener and the missing woman was completed. Following days of microscopic examination, the final results were: one head hair fragment consistent with the known hair brush samples was found on a sheet recovered from the back of the suspect's truck, and from more than the 150 hairs recovered from her bedroom, one head hair found on a flat sheet was consistent with his [15].

On June 14, 1993, the part-time gardener plea bargained to a reduced charge of murder in the second degree with the stipulation to provide information regarding the exact location of the body. The body was found in a three foot grave located not far from his campsite (Fig. 8). The condition of the body was prohibitive for determination of the exact cause of death. When the body was recovered, bits of duct tape were found stuck in her hair. The part-time gardener admitted to using a pair of scissors, the type of weapon that would match the bloody outline on the pillow. The scissors, however, were never recovered. The certificate of death only states "cutting wound of neck and possibly suffocation." He was sentenced to 30 years in the State Penitentiary.

The part-time gardener offered no further explanations during his sentencing, but the following scenario is speculative of what took place almost a year earlier.

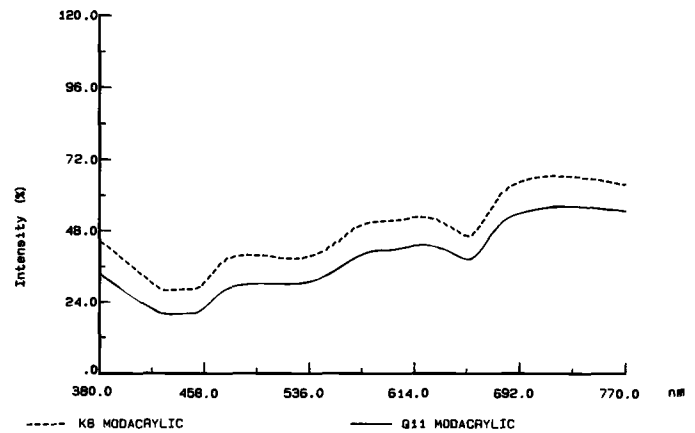


FIG. 7—Spectral fingerprint of the dyes from the wig fiber and the recovered wig.

In early October, he purchased his listed items from the local hardware store in anticipation of a planned trip that would take the woman's mother away, leaving her home alone. On Sunday evening, he used his key to enter the house. Death was initiated by suffocation, shown by the lack of blood stain patterns. Duct tape was wrapped around her face and scissors were used about her head and neck. The woman was then "mummified" in her own bed linens and carried out of the back sliding glass door of the house. Shortly after leaving the backyard it is speculated that he had to put the body down in order to catch his breath and regain his strength. On continuing his task, he failed to notice the dropped pillow and pillowcase.

In the early morning hours, he returned to the house and dressed in preparation to play the role of the now deceased woman. Checking his appearance in her bedroom mirror, he picked up one of the hair brushes to touch up the wig he was wearing. Carrying her briefcase, he then walked out into the crisp fall morning air to establish the pretense of her heading off to work. After changing some distance away, he drove to a department store and purchased a bed sheet. He had intended to properly make up the sparsely covered bed. He never accomplished this task since the woman's brother and friend has started to canvass the neighborhood seeking information regarding her whereabouts. Recognizing the part-time gardener's vehicle they approached it hoping to question him about her. They never had the chance to ask, he sped away disregarding their pleas to stop and talk. His inter-state travels to and from storage facilities have yet to be explained.

This case holds a unique place in the annals of Maryland law because convictions are rarely obtained solely through the compilation of physical evidence without the prior discovery of the physical body.

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FIG. 8—Shallow grave site.

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