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Memorandum Opinion Regarding Admission of Expert Testimony of Mr. James Wentzel and Dr. Owen Lovejoy

Judge Ronald Suster
Cuyahoga County Court of Common Pleas

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3-20-00

STATE OF OHIO)
) SS.
CUYAHOGA COUNTY)

IN THE COURT COMMON PLEAS
CASE NO. 312322

CHARLES MURRAY, et al.,)
)
Plaintiff,)
)
vs.)
)
STATE OF OHIO,)
)
)
)
Defendant.)

**MEMORANDUM OPINION
REGARDING ADMISSION OF
EXPERT TESTIMONY OF MR.
JAMES WENTZEL AND DR.
OWEN LOVEJOY**

Plaintiff has moved to exclude testimony which Defendant has indicated it plans to adduce from two persons who conducted experiments for the Cuyahoga County Coroner's Office in the instant case.

James Wentzel, a forensic photographer and crime scene reconstructionist employed by the Coroner's Office, participated in the Coroner's Office's recent investigation of this case. The State desires to call Mr. Wentzel to testify about the following conclusions which he has reached:

- (1) The autopsy photographs of Richard Eberling and Marilyn Sheppard, respectively, are not of suitable quality to permit a reliable skin print analysis.
- (2) Numerous blood stains can be located and measured in the Sheppard home and on various items which were believed to be in the home at the time of her death, including Dr. Sheppard's watch; in connection with this conclusion, Mr. Wentzel will also be offered as a witness to explain how he developed a composite photo of the watch.
- (3) The bloodstains on Dr. Sheppard's watch, as depicted in the composite image, are consistent with high velocity

bloodstains which would entail the watch being close to a blood source at the time of Marilyn Sheppard's murder.

- (4) Based on experimentation conducted by Mr. Wentzel, the pattern of blood found on the pillow of Marilyn Sheppard is the result of wet blood on an object being placed on the pillow after surface blood on the pillow had dried; that an unknown object other than a "1950's vintage flashlight" or an instrument with a smooth stainless steel type finish is the source of the imprint; and that the placing of this object in contact with the pillow could not have occurred for at least the first hour after Marilyn Sheppard's death because of the amount of time required for blood to dry on the pillow.

For reasons discussed, *infra*, Mr. Wentzel may testify about items (1) and (2), above, but not about items (3) and (4).

The State also wishes to have Dr. Owen Lovejoy, a forensic anthropologist contracted by the Coroner, testify about his experiments with striking a replication of Marilyn Sheppard's skull with different instruments, including a flashlight which Dr. Lovejoy has described as a 1950's "vintage flashlight." For reasons discussed *infra*, Dr. Lovejoy will be allowed to testify about his experiments, however, he may not describe the flashlight used as being in existence in the 1950s, unless he has personal (*i.e.* first-hand) knowledge that such a flashlight did exist *circa* 1954; in addition, he may not opine that the flashlight used is typical of flashlights used in the 1950s.

A. The Wentzel Testimony

1. Background

As part of its investigation into the death of Marilyn Sheppard, the Coroner's Office assigned James Wentzel several projects. Wentzel has been employed as a forensic photographer by the Coroner since 1985. In addition to forensic photography, Wentzel has been involved in

crime/accident scene reconstruction, including computer-designed reconstruction. He has taken more than four years of college coursework, primarily in engineering and industrial design. He has testified as an expert in the general areas of forensic photography and scene reconstruction.

Wentzel set about to determine if a reliable comparison could be made of the autopsy photos of Richard Eberling and Marilyn Sheppard in order to determine whether Eberling exhibited a scar on his wrist which could have been caused by Marilyn Sheppard's fingernail. Wentzel, who has previously made photographic comparisons of imprints and who has previously taken forensic photographs which were used by another skin mark expert, concluded that the autopsy photographs were not of sufficient quality to permit a comparison in this case.

Wentzel also digitized and analyzed various crime scene photographs. In addition, he prepared a composite photograph of Dr. Samuel H. Sheppard's wristwatch. From these, he was able to identify and measure various spots which appear to be blood stains. The Court does not understand Plaintiff to be challenging the admissibility of Wentzel's photographs; the Court also does not understand there to be a dispute that the stains depicted are blood stains of the size Wentzel calculated. What is in dispute is the validity of what Wentzel next did with these photographs. Relying on literature which he believed to be scientifically authoritative, Wentzel found that the size of the spots he identified were consistent with high velocity blood stains, indicating that the stained surface was within three feet of a blood source (e.g. Marilyn Sheppard as she was struggling).

Finally, in consultation with other members of the Coroner's staff, Wentzel designed an experiment to attempt to replicate the appearance of a stain on a pillow which Wentzel found to be unusual. Wentzel's goal in designing this experiment was to determine if the symmetric

imprint that he observed on the bloodstained pillow was the result of an object resting on top of the pillow or whether the pillow was folded on itself or around the object. Using approximately 48 pillows, Wentzel stained each with 10 ml of blood and attempted to produce an identical symmetrical imprint through a combination of placing objects on the bloody pillow and/or folding the bloody pillow, with the blood being allowed to reach various degrees of wetness/dryness. In the end, Wentzel's experiment failed to discover whether the object rested on the pillow or whether the pillow was folded around it. Moreover, Wentzel was unable to determine what type of object caused the symmetrical imprint.

Of apparently more importance to the State is that Wentzel's experiment had several unintended consequences. Wentzel concluded that the pillow had to have been stained by the wet blood on an object being placed on the bloody pillow after the underlying blood had dried.

Based on his experimental observations Wentzel also reached various conclusions about the amount of time needed for 10 ml of blood to dry, both to the touch and to a point where it would not produce a transfer stain on an underlying cotton sheet. In addition, on the basis of how blood clung to a flashlight and to another stainless steel object, Wentzel ruled out the flashlight as the source of the imprint and also discounted the possibility that the source of the imprint was an object with a smooth stainless steel type finish

2. Wentzel's Photographic Composites/Reproductions

There is no dispute between the parties that Wentzel is a qualified forensic photographer. His credentials in this regard are more than sufficient to qualify him on the basis of his "specialized knowledge, skill, experience, training and education." Ohio R. Evid. 702(B). Accordingly, he may testify as to his preparation of the composite photo of the watch and as to

his photographic enhancements of 1954 crime scene photos. Assuming that there continues to be no dispute that the dark stains depicted in those photos is blood, he may characterize the stains as “bloodstains,” despite the fact that he is not qualified as a blood expert.

3. **Wentzel’s Testimony Concerning the Autopsy Photos**

Consistent with his expertise in forensic photography is Wentzel’s ability to make photographic comparisons. He possesses a “trained eye” which enables him to see fine distinctions which the average juror may miss. He also is knowledgeable of the characteristics of perspective and scale which may cause two items similar in appearance to not be the same. For these reasons, his opinion that the Eberling autopsy photographs and the Marilyn Sheppard autopsy photographs cannot be compared is of aid to the jury who has already heard another expert, Dr. Sobel, offer opinions on Eberling’s skin marks based on these same photos.¹

In admitting this testimony, the Court is not recognizing Wentzel as a skin mark expert. Had the skin mark opinions elicited thus far not depended upon photographs (*e.g.* if the expert had been present at the original autopsies of Marilyn Sheppard and Richard Eberling and based his conclusions on first-hand observations), then Wentzel’s testimony would be irrelevant. However, because the skin mark opinions of Sobel depend upon photography, Wentzel’s expertise in the photographic process is of help to the jury. Whether the jury chooses to believe Wentzel and conclude that the photographs upon which Sobel relied are themselves incapable of comparison, or whether the jury chooses to believe that Sobel’s expertise in skin mark

¹ The Court understands that Wentzel will be testifying about the quality of the same photos upon which Dr. Sobel based his skin mark identification testimony. If this is not the case, Defendant should bring this to the Court’s attention before adducing any testimony in this area.

identification was sufficient to permit him to make a comparison, is a question of weight, not admissibility.

However, because Wentzel is not a skin mark identification expert, he may not testify (and the Court does not understand that he would attempt to testify) that any particular mark on Eberling's wrist was or was not caused by Marilyn Sheppard's fingernail; his testimony is confined to assessing photographic quality and the ability to make comparisons from the photos at issue.

4. Wentzel's Interpretation of the Blood Stains He Photographed.

Wentzel may not interpret the blood stains based on his review of scientific literature. While the Court is impressed by Wentzel's general intelligence, he is not a blood stain expert. It would be improper for Wentzel to tell the jury that his review of the scientific literature revealed that blood stains of the size and/or shape he found are "high velocity" stains.

As an initial matter, Wentzel is not qualified to tell the jury that the literature he reviewed is authoritative in the field. It may very well be that the literature he reviewed is not well-accepted, runs contrary to other schools of thought, or is outdated by recent developments. Wentzel is not qualified to know what shortcomings exist. It is one thing for an expert in a field to read a treatise in the context of his or her education, training, experience, *etc.* It is a completely different matter for an expert in a different field to merely repeat what is in reference sources in an area outside his expertise. In the end, Wentzel can help this jury detect blood spots, not interpret them.

5. The Pillow Testing

The pillow testing is the final area about which Defendant wishes Wentzel to testify. In

this regard, the Court finds that the novel scientific testing employed is not sufficiently reliable to be admissible as to the intended consequences of the experiment -- which was to try to determine whether the source of the symmetrical imprint on the bloody pillowcase was an object which rested on the pillow or an object around which the pillow was folded, or the result of folding the pillow upon itself. The Court finds that the tests possess even less reliability for the purposes for which the test is now being offered - (1) to eliminate the flashlight as a potential source of the imprint, (2) to discount the possibility that the object which caused the imprint was of a smooth stainless steel type finish, (3) to reach conclusions about the relative dryness or wetness of the underlying pillow and the object which caused the imprint, and (4) to reach conclusions about the length of time necessary for blood to dry. As a related matter, even if the test design had been sufficiently reliable to disclose the information which the State now wishes to have admitted into evidence, Wentzel was not qualified to administer the test, nor is he qualified to testify about its results.

With respect to the reliability of the test, the Court's starting point is Ohio Evid. R. 702(C) which requires that a qualified expert can testify about tests and experiments only when:

- (1) The experiment is based on an objectively verifiable theory "or is validly derived from widely accepted knowledge, facts, or principles."
- (2) The experimental design "reliably implements the theory."
- (2) The experiment was conducted in such a way as to "yield an accurate result."

Ohio Evid. R. 702.

Rule 702, "as a prerequisite to admissibility, require[s] an expert to ground his or her conclusions in reliable methods and principles." *Miller v. Bike Athletic Company* (1998) 80

Ohio St.3d 607, 618 (Cook, J., dissenting). “Reliability must be shown both as to the test generally (that is, the underlying theory and the implementation of the theory) . . . as to the specific application.” *Id.* quoting Staff Note to July 1, 1994 Amendment of Evid. R. 702.

In evaluating the reliability of scientific evidence, several factors are to be considered: (1) whether the theory or technique has been tested, (2) whether it has been subjected to peer review, (3) whether there is known or potential rate of error, and (4) whether the methodology has gained general acceptance. [citing to *Daubert v. Merrell Dow Pharmaceutical, Inc.* (1993), 509 U.S. 579, 593-94]. Although these factors may aid in determining reliability, the inquiry is flexible.

Miller, 80 Ohio St.3d at 611.

In *Miller*, a divided Supreme Court (4-3) reversed the trial court’s decision to exclude an expert’s opinion that a football helmet could protect against neck injuries (as opposed to head injuries). The plaintiff in *Miller* was a high school football player who suffered a serious neck injury as a result of a head-on collision with another player. There was evidence that the helmet Miller was wearing, which had inflatable chambers which served as shock absorbers, was not properly inflated. Miller’s expert (whose expertise was not questioned), a mechanical and biomedical engineering consultant, was of the opinion that, if properly inflated the helmet would have protected Miller’s neck as well as his head from the injury incurred. In support of his opinion, the expert subjected the helmet to an experiment whose standards had been established by the National Operating Committee on Standards for Athletic Equipment (“NOCSAE”).

The Supreme Court in *Miller* noted that both the expert’s theories concerning neck injuries and the use of the NOCSAE test in relation to neck injuries were supported by some early literature which had later been amended as well as by other publications. The *Miller* court

went on to note that none of the *Daubert* criteria were absolute prerequisites to admissibility. “The ‘ultimate touchstone is helpfulness to the trier of fact, and with regard to reliability, helpfulness turns on whether the expert’s technique or principle [is] sufficiently reliable so that it will aid the jury in reaching accurate results.’” *Miller*, at 614, quoting *DeLuca v. Merrell Dow Pharmaceuticals, Inc.* (3rd Cir., 1990), 911 F.2d 941, 956 (internal citations within *DeLuca* omitted; bracketed material appears as such in *Miller*).

In the instant case, the Court finds that the Coroner’s tests are not sufficiently reliable to satisfy this standard. The Court has heard testimony regarding the pillow testing from Coroner Balraj and from Mr. Wentzel. In addition, the Court reviewed Wentzel’ report of his findings and the discovery deposition of Mr. Wentzel, neither of which contradicts his testimony in court.

a. The Pillow Test’s Original Purpose: Replicate the Design

The purpose of the test was to determine if he could replicate the symmetrical design he observed on the pillow, either by placing an object on top of the pillow, by folding the pillow around an object, or by merely folding the pillow on itself. (Dep. Tr. at 93, Report at 8). Both the Coroner and Wentzel confirm that the test had never been done before to their knowledge, either in Cuyahoga County or anywhere else. Coroner’s staffmembers who participated in the formulation of the experimental did include several other individuals besides Wentzel and Coroner Balraj. Some of these individuals may have been more knowledgeable about bloodstain patterns and trace evidence than Wentzel. What these persons added to the test design is unclear, particularly in light of the stated purpose of the test. Moreover, these persons did not implement the test – Wentzel did.

Nor is the Court satisfied that the manner in which the test was implemented was

sufficiently reliable to ascertain what was intended. Wentzel testified that four series of tests were conducted; a different number of pillows were used for different tests, though there did not appear to be a scientific reason for this variation. On at least one occasion, the testing was interrupted because the Coroner's office ran out of pillows. The pillow cases were new, not laundered, and, based on Wentzel's testimony, no thought was given to the effect, if any, that laundering the pillowcases might have had on the imprint. Ten milliliters of blood was poured on each pillow, although why this amount of blood was reasonably calculated to produce the intended consequences of the testing is not entirely clear.² With respect to the third and fourth series of tests, which was intended to test for whether the stain could have been the result of a random folding of the pillow, Wentzel experimented with whether he could replicate the symmetrical design by folding the pillow.

There is no evidence that the approximately nineteen pillows used in this portion of the experiment sufficiently replicated the possible ways of folding a pillow so as to make it reasonable to exclude pillow-folding as a possible source of the stain; Wentzel's theory that "random folds don't reflect symmetry" (Dep. at 77) appears to be untested in a reliable fashion -- and the Court has heard no evidence that this theory is otherwise reliable. Indeed, Wentzel is unwilling to conclude that it is impossible for a folded pillow to produce the symmetrical imprint he observed on Marilyn Sheppard's pillow (Dep. at 75).

b. Unintended Consequence No. 1: Wetness and Drying

When inquiry shifts to the unintended consequences of the experiment which form the

² As Wentzel stated in his deposition, "[t]he only part of the whole pillow that I was concerned with was that actual imprint . . ." (Dep. at 76).

gravamen of Wentzel's report -- the wetness and dryness of the blood as well as the possibility that the flashlight or other stainless steel object caused the stains -- the experiment becomes all the more unreliable. The test is still unprecedented; the Coroner's Office did not seek peer review from an outside source³. The underlying theory becomes even less clear because it was never articulated as a basis for designing the experiment in the first place, although it may have become the basis for the manner in which the experiment continued to be conducted.

The design of this unprecedented experiment as a basis of testing theories relating to blood wetness/dryness and drying times did not take into consideration whether there had been anticoagulants added and how, if at all, anticoagulants might have affected drying time. In this regard, Wentzel testified in his deposition that he thought that one series of tests (involving folding) used fresh blood with no anticoagulants, while at least one other series of tests used blood from the Red Cross which may or may not have included anticoagulants. No consideration was given to whether drying times are affected by the previous laundering of the pillowcases. Air circulation and temperature were not measured; the available literature indicates these factors could affect drying times. See Lauber and Epstein, Experiments and Practical Exercises in Bloodstain Pattern Analysis, Defendant's Exhibit 180. Indeed, as Wentzel stated in his deposition, "I think it's important to note that this experiment has nothing to do with drying

³ The Court is aware that law enforcement concerns may cause the Coroner to have to be circumspect in seeking outside peer review for active cases; nonetheless, there has been no peer review. The Court is also aware that Plaintiff's blood pattern expert, Bart Epstein, remarked to Wentzel, upon seeing the testing in progress, that this experiment should be the subject of publication. However, publishing one's results can be a first step toward ascertaining whether the experiments are reliable; the Court does not interpret Epstein's remarks as the equivalent of his *imprimatur* on the Coroner's tests.

times.” (Dep. at 73). Wentzel should be taken at his word in this regard.

The State argues that the reliability of Wentzel’s experimental results concerning drying times is evidenced by the fact that Wentzel concluded that the drying time for 10 ml of blood was approximately two hours and 45 minutes, which result is consistent with other literature in the field. *See*, Lauber and Epstein, Experiments and Practical Exercises in Bloodstain Pattern Analysis, Plaintiff’s Exhibit 180. There are two problems with this argument. First, in reviewing novel scientific experiments, the Court is required to focus “solely on principles and methodology, not on the conclusions that they generate.” *Miller*, 80 Ohio St.3d at 611-612, quoting *Daubert*, 509 U.S. at 595.

Second, even if it could consider results in determining the reliability of the tests in question, the Court is not convinced that Wentzel’s experiment yielded results consistent with the cited material, as the State contends. The cited material listed the drying time for 5 ml of blood on cotton cloth at Condition 1 (Normal room circulation, 75 degrees Fahrenheit, relative humidity 44%) to be 3 hours. Appendix 1 at 100, 103. Based on the fact that 5 ml of blood on cotton at Condition 1 took longer to dry than did 1 ml of blood on cotton at Condition 1, *compare* Exhibit 180 at 102 and 103, it would appear that the 10 ml of blood in Wentzel’s experiment should have taken even longer than 3 hours to dry. Without some indication of the acceptable standards of deviation attendant to the published drying times in the Lauber and Epstein book, the Court is unable to say, one way or the other, that Wentzel’s results are consistent with the cited material.

c. Unintended Consequence No. 2: Blood’s Viscosity on Steel

The next unintended consequence that Wechtel noted was that blood tended to cling to

the surface of stainless steel instruments, including the flashlight which was used in the experiment. Again, the test was not designed to determine this and there is no indication as to whether this unintended consequence may or may not have been dependent upon the amount or type of blood used, the temperature in the testing room or the air circulation. Moreover, the Coroner's Office did not establish that its tests could validly determine blood's viscosity on stainless steel. In this regard, the Court is particularly concerned that Wentzel, the chief architect and executor of the experiment, is neither experienced, trained nor educated in disciplines relating to blood's viscosity.

d. Wentzel's Expertise Regarding the Unintended Consequences

Up until now, the Court has focused on how Wentzel's lack of scientific training and experience made the design and implementation of the tests employed all the less reliable, particularly as they related to the unintended consequences. In addition, the Court does not believe that Wentzel is qualified to render an expert opinion interpreting the unintended consequences of his experiments. Wentzel's training, experience and special skill is that of a "trained eye." He is able to make observations about perspectives and details which the normal juror would not necessarily comprehend, particularly when dealing with the limitations of two-dimensional photography's attempts to depict a three-dimensional world. For these reasons, the State may have Wentzel testify about his observation of a symmetric imprint on the pillow case, as depicted in the 1954 photos and without reference to his pillow experiments.

Moreover, as demonstrated in the caselaw cited by the State, Wentzel's expertise has quite logically included scene reconstructions, which again take into consideration Wentzel's expertise in spatial interpretation. But, in the "pillow experiments," Wentzel, finds himself as a

witness to a series of unintended consequences which go beyond his expertise. He is no longer being asked to compare two imprints, or even to determine if particular angles and distances are harmonious. Here, he is being asked, not to compare two images, but to determine how one particular image (the symmetric design) came into existence. That conclusion requires a knowledge of properties of the various materials which contributed to that symmetrical image -- blood and fiber, to name the most apparent. It is here that Wentzel is being asked to go beyond his expertise -- and thus, his opinion ceases to be helpful to the jury.

These remarks are not intended as a criticism of Wentzel -- he had no way of knowing that his experiment which was intended to be a visual replication would tend to produce unintended consequences touching on areas of which he had limited knowledge. It is much to his credit that he made the observations he did concerning areas in which he was working outside of his field.

In oral argument, the State contended that these unintended consequences should nonetheless be admitted. The State compared Wentzel's unintended discovery to the accidental discoveries which have produced useful and generally accepted inventions in American industry. There are two problems with the State's argument. First, when an industrial research and development unit discovers something by "accident," their response is not to immediately market the product. On the contrary, the accidental result is sought to be replicated in subsequent testing according to reliable norms, it may be subjected to peer review and/or publication, it is examined to determine if it is consistent with known scientific principles. This was not done in the instant case.

The second problem with the State's argument is it fails to recognize that the cutting edge

of science will oftentimes fail to be admissible in Court. *Daubert* acknowledged that the courtroom was not the place for scientific innovation – to be admissible, scientific research must be “reliable.” The day may come when Mr. Wentzel’s pillow experiments will be recognized in forensic circles as reliable. Further testing, peer review, publication or other indicia of scientific reliability may someday demonstrate that Mr. Wentzel was ahead of his peers in the design and execution of this innovative experiment. His unintended conclusions may well guide others in the future. But that day has not yet arrived. At this point, the Court can only conclude that the tests employed do not exhibit the type of reliability which can cause the Court to open the gate to admissibility.

B. The Lovejoy Wound Replication Experiments

Plaintiff seeks to preclude Defendant from introducing the testimony of Dr. Owen Lovejoy regarding his attempts to determine the type of instrument used to inflict the wounds to Marilyn Sheppard’s skull.

As an initial matter, the Court does not understand there to be any objection to Dr. Lovejoy’s expertise in forensic anthropology or to any anthropological observations or opinions which the State intends to introduce.

1. Background

In consultation with the Coroner’s Office, Dr. Lovejoy devised an experiment to inquire into the nature of the weapon used to strike Marilyn Sheppard’s head. In order to do this, Dr. Lovejoy first designed a model of a female head. Based on his training and experience in the anatomical characteristics human body, Dr. Lovejoy supervised the construction of a model of a human head, using a skull into which he placed suet as a substitute for brain matter and around

which he used a type of clay to simulate the dermis and subdermal tissue.

Dr. Lovejoy fixed the model head to a weighted substance in such a manner as to replicate the juncture between the skull, neck and torso. The model was located on a mattress on a floor. Dr. Lovejoy then knelt beside the model and, using different instruments, attempted to inflict wounds of a type observed in the Marilyn Sheppard autopsy. He concluded that a flashlight, described to him as being of 1950s vintage, was incapable of causing the wounds present on Mrs. Sheppard because Dr. Lovejoy's attempts to strike the head with the flashlight were unable to cause sufficient damage to the head. The test was discontinued after the flashlight sustained damage which made continued striking, in Dr. Lovejoy's opinion, unfeasible. Testing with different, more massive/dense objects, Dr. Lovejoy was able to conclude that the murder weapon was more massive/dense than the flashlight but less massive/dense than other tools used in his experiment.

2. Admissibility of the Lovejoy Wound Replication Experiment

The Court will allow the State to introduce evidence of Dr. Lovejoy's experiment. Rule 702 mandates that scientific procedures must be sufficiently reliable to be admitted. Here, having heard the testimony of Dr. Lovejoy outside the presence of the jury, the Court is satisfied that the principles underlying the test are sufficiently reliable. The principles of striking the model of the skull employ basic physics. The Court's main concern was with the reliability of the reconstruction of the head. The Court is satisfied that, based on accepted anthropological principles, the test head employed in the experiments is of no greater strength than a normal female head; differences in this regard affect weight, not admissibility.

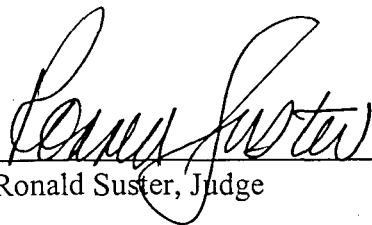
The Court notes that, while the experiment cannot rule out all flashlights as the potential

murder weapon, the results are probative of the mass and density of the blunt instrument used to produce Mrs. Sheppard's wounds. Dr. Lovejoy's testimony that the blunt instrument used on July 4, 1954 was more massive/dense than the flashlight used and less massive/dense than the other instruments used, is probative in the jury's determination of what happened on July 4, 1954. It is thus "helpful" to the jury, *see, Miller, supra*, particularly in light of the testimony that a "flashlight" was recovered more than one year after the murder. Without this testimony, the jury might be misled into thinking that any flashlight could have been the murder weapon. With this testimony, the jury will not suffer from such a misapprehension.

However, unless Dr. Lovejoy has personal (*i.e.* first-hand) knowledge that flashlights of the type used in the experiment existed *circa* 1954, he may not refer to it in a manner that suggests that the flashlight was a 1950's vintage flashlight. Moreover, Dr. Lovejoy cannot testify that the particular flashlight used is representative of 1950s flashlights in general unless the State can produce evidence which would cause a reasonable juror to believe that all Everready flashlights available circa 1954 are of similar or lesser density.

March 20th 2000

Date



Ronald Suster, Judge