



f. Mrs. Sevigny used the Association of Firearm and Toolmark Examiners' (AFTE) Theory of Identification to determine if the cartridge case was struck and ejected by the AK-47. To conduct this examination, Mrs. Sevigny test-fired 6 rounds from the AK-47. She then compared the marks made on the cartridge cases from the 6 known rounds with those on the cartridge case found at the scene of the alleged shooting using a comparison microscope. Using the AFTE Theory of Identification, Mrs. Sevigny was able to form an opinion that the known cases and the case provided to CID were fired by the same weapon if the surface contours on the casings were in "sufficient agreement." Sufficient agreement exists when the agreement exceeds what she has personally seen through her training and experience in two toolmarks known to be produced by different tools and is consistent with agreement she has seen in toolmarks known to have been produced by the same tool. In this case, Mrs. Sevigny found sufficient agreement in the cases test-fired from the AK-47 and the one retrieved from the scene of the alleged shooting.

g. Mrs. Sevigny passed the cartridge cases to another examiner to verify her results. The second examiner performed the same microscopic exam and also determined that there was sufficient agreement in the cases.

h. Mrs. Sevigny will testify that the AK-47 made the marks found on the cartridge case and that it would be practically impossible for another tool to have made those marks.

## 2. Law and Analysis.

a. Proffered expert testimony must meet the following criteria in order to be admissible:

- (1) The expert is qualified;
- (2) The subject of the testimony is within the realm of the expert's qualification;
- (3) The expert has an appropriate basis for the testimony;
- (4) The testimony is relevant;
- (5) The testimony is reliable;
- (6) The testimony meets the balancing test under MRE 403. *United States v. Houser*, 36 MJ 392 (1993).

b. In the instant case, the Court concludes that:

(1) Mrs. Sevigny has ample qualifications to testify in the fields of firearm and toolmark examination based upon her education, background, training, and experience as demonstrated in her Statement of Qualifications (AE XIII) and her in-court testimony. Additionally, Mrs. Sevigny has been qualified as an expert in this field and testified in court approximately 50 times.

(2) The subject of the testimony is clearly within the realm of Mrs. Sevigny's qualification. The examinations that Mrs. Sevigny conducted are precisely the types of examinations she has been trained to conduct and which she has been conducting for at least 8 years.

(3) Mrs. Sevigny has an appropriate basis for her testimony, as she was able to examine both the AK-47 seized from the accused's apartment and the cartridge case recovered from the scene of the alleged shooting.

(4) Mrs. Sevigny's testimony would be relevant to corroborate eyewitness reports that rounds were fired from the AK-47 at the scene.

(5) In order to determine whether the proffered toolmark examination was reliable, the Court applied the following factors identified by the Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals' Inc.*, 509 US 579 (1993):

- (a) Whether the theory or technique used can be and has been tested;
- (b) Whether the theory or technique has been subjected to peer review and publication;
- (c) Whether the known or potential rate of error is acceptable; and
- (d) Whether the theory or technique enjoys widespread acceptance in the scientific community.

(7) In the instant case, the Court concludes:

(a) Toolmark examination is tested both to determine the proficiency of examiners and the validity of the process. The AFTE community has conducted numerous tests to determine whether each tool truly does produce unique marks. Additionally, the AFTE community tests its examiners using tests developed by independent organizations. Although AFTE is well-intentioned in its testing, the test results are not consistently reliable for a number of reasons. The tests are not blind, meaning that the examiners know they are being tested and in some cases are not required to submit their results, thus potentially skewing the results. Also, the tests do not consistently mirror the level of difficulty presented during routine operations. In most tests, examiners are given samples and asked to make determinations as to whether the casing is a match to the weapon, excluded as a match to the weapon, or inconclusive. The examiners are then "graded" to determine if they made any false positive or false negative determinations. Findings of inconclusive when the answer was really a known match or known non-match do not count against the examiners, which likely causes examiners to be more conservative in their finding of sufficient agreement than they would ordinarily be when performing examinations on a daily basis.

(b) Toolmark examination is subjected to both peer review and publication. The articles produced in this field appear in the AFTE Journal, which is a publication created by and intended

for members of AFTE and which is not widely available throughout the scientific community. Although AFTE is a relatively small community, not all peer reviewers are tool examiners; a reviewer may be a statistician, metallurgist, etc. depending on the subject matter of the article.

(c) Although error rates have been calculated, these rates may be inadequate. They are often based on false positive or negative reports and do not incorporate the examinations in which an examiner incorrectly identifies a known match or known no-match as inconclusive. Further, the results of testing may be skewed by self-selection or testing methods as indicated previously.

(d) Toolmark examination has enjoyed widespread acceptance in the scientific community for well over 50 years. Recently, however, the National Academy of Sciences Report on Forensic Sciences raised doubts about the reliability of certain forensic sciences, to include toolmark examination. The subjective nature of the analysis and inability to reproduce results are just some of the complaints about toolmark examination.

(e) Considering the Daubert factors in light of Mrs. Sevigny's anticipated testimony, the Court finds that any testimony indicating that the shell casing must have come from the AK-47 would be unreliable. While it is clear that Mrs. Sevigny has training and expertise in identifying toolmarks that would undoubtedly assist the trier of fact in this case, the subjective nature of the process, lack of quantitative standards, and limited scope of foundational testing do not demonstrate the scientific principles necessary to establish the origin of the marks with any specific amount of certainty.

(8) Conducting a balancing test under MRE 403, the Court concludes that the probative value of Mrs. Sevigny's proffered testimony that it would be practically impossible for a tool other than the seized AK-47 to have made the marks on the cartridge case would be substantially outweighed by the unfair prejudice associated with its unreliability.

3. Ruling. Accordingly, the defense motion to exclude the testimony of Mrs. Sevigny that it would be a practical impossibility for the cartridge case to have been fired by any weapon other than the seized AK-47 is GRANTED. This ruling is limited solely to testimony concerning the level of certainty of the origin of the marks.

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WENDY P. DAKNIS  
LTC, JA  
Military Judge