Expert finds fault with blood tests in Avery trial

Andy Nelesen

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CHILTON — The Steven **Avery** homicide trial opened Friday with testimony from Janine Arvizu, a laboratory auditor who questioned the accuracy of FBI test results of bloodstains found in Teresa Halbach's vehicle.

The FBI's hastily developed testing protocol was fine for confirming the presence of EDTA, a chemical preservative, but was not designed to rule out its presence in a bloodstain, Arvizu said.

Arvizu, of Albuquerque, N.M., was the 58th witness to take the stand in the **Avery** homicide case being tried in Calumet County. **Avery**, 44, of Mishicot, is charged with homicide, mutilation of a corpse and false imprisonment for allegedly killing Halbach and burning her body to conceal the crime.

Earlier this week, FBI chemistry section chief Marc LeBeau testified for the prosecution and said bloodstains found in 2005 in Halbach's sport utility vehicle — shown to be **Avery**'s through DNA tests — did not contain EDTA.

LeBeau said a vial of **Avery**'s blood that defense attorneys say was used to plant evidence contained EDTA — ethylene diamine tetraacetic acid — and therefore was not the source for the blood in Halbach's Toyota Rav-4.

Avery's blood was drawn in 1996 while he fought for his freedom after a 1985 sexual-assault conviction. He was later cleared through DNA typing using a different sample.

Avery's attorneys discovered the vial in 2006 stored in an unsecured file in the Manitowoc County Clerk of Courts office. The evidence tape on the vial was broken when it was examined later in the presence of prosecutors and defense attorneys. **Avery**'s attorneys say Manitowoc County Sheriff's officer had motive to plant evidence because he was suing the county for the wrongful 1985 rape conviction.

LeBeau testified that his tests could detect the presence of EDTA in samples as small as one microliter — about 1/50th of a drop — and in concentrations as low as 13 parts per million.

Arvizu challenged that opinion Friday. She asserted that there may have been EDTA present below the detection limits of the test. Arvizu said the concentration of the original source was an unknown and a factor in the analysis.

"The problem really occurs when EDTA is not detected in a bloodstain," Arvizu said. "The problem in that regard is from this method, I don't know whether this is simply because they didn't detect it or because it wasn't there. I can't tell the difference between the two for this method."

Arvizu testified that LeBeau's results fell short of supporting his conclusions.

"The fact that EDTA was not detected in a stain does not mean EDTA was not in the stain," Arvizu said, noting that the limits of the analysis machine might not have been low enough to find the chemical.

The protocols used did not make the results clear, Arvizu said, adding that she reviewed the documentation from the FBI tests.

"I don't know if they didn't see it or it wasn't there," she said.

LeBeau testified that he tested three samples from Halbach's vehicle and found no EDTA. Three other bloodstains were untested. LeBeau extrapolated that he didn't expect to find EDTA in the three other samples.

Arvizu was critical of those assertions.

"We're not in the business of guessing what is in samples," Arvizu said. "There's no way for an analytical chemist to know what's in a sample unless we test it."

Science on a production line

Arvizu is critical of high-volume crime labs in general and has authored papers and articles on the topic.

"Experience has shown in the business of science it's really, really hard to do science on a production line," Arvizu testified Friday. "I managed an analytical lab for the Department of Energy for a number of years and it's a really, really hard job to do.

"What we're really asking these laboratories who are testing unknown samples is to practice science day after day after day in a highly defensible and valid manner," she said. "It's a really hard job."

"The experience has shown, in the measurement of science business, the best way to ensure the reliability and the validity of the results is to have a very rigorous quality assurance program in place," she said. "It's not a management gizmo of the week. It's a very technically driven job to put in place quality control practices and measures to ensure you consistently reliably produce good quality data."

Cause of death disputed

Avery's attorneys spent the morning attacking the FBI test results, but turned their focus to the prosecution's analysis of burned remains in Friday's afternoon session.

Scott Fairgrieve, a Canadian forensic anthropologist, said he disagreed with some of the findings of Leslie Eisenberg, the forensic anthropologist who helped investigators evaluate the charred remains recovered on the **Avery** property Nov. 8, 2005.

Eisenberg, who testified in the prosecution case on Feb. 28 and March 1, said she thought the remains found on the **Avery** property were from an adult female, probably younger than 35 years old. She also testified that she thought the person died as the result of a homicide, likely gunshot wounds to the head.

Fairgrieve said he agreed that the body was a mature female, but said he didn't see anything that would allow him to specify an age. He agreed that the victim likely sustained two gunshots to the head, but he disagreed with Eisenberg's determination of homicide.

He said there is no way to know they were the cause of death.

No systematic approach

During the prosecution case, a DNA expert testified the remains contained Halbach's DNA, and a forensic dentist said dental fragments were consistent with X-rays from Halbach's dental records.

Fairgrieve also challenged the manner the remains were recovered.

"There was no systematic approach to the evidence at first processing," Fairgrieve said, adding he was concerned there "wasn't a more forensic anthropological approach" to the evidence recovery.

Fairgrieve suggested that more care should have been taken while collecting the remains, pointing out that investigators used a shovel to scoop out material and sifted through the debris in the burn pit on the **Avery** property.

Had more information been collected at the scene, it could have revealed more about how the body was burned and whether it was moved after being burned, Fairgrieve said.

During her testimony, Eisenberg said she thought that the remains were burned in the **Avery** burn pit because they didn't exhibit signs of breakage usually associated with being moved after being burned.

Fairgrieve said that because remains were found in two places — in the burn pit and in a burn barrel near **Avery**'s sister's trailer — it suggested that the remains had been moved. He testified that in his experience, the site with the most remains was the place bones were moved to and not the original burn site.

Fairgrieve said it was his opinion that it was not possible to make any positive determination on whether the bones were moved because the initial recovery efforts were poorly documented.

Eisenberg's theory that where investigators find the most fragile of bones is the probable burn site doesn't hold water, Fairgrieve said. He testified he has found some of the body's smallest bones at secondary sites.

Fairgrieve said this is the first time he has testified for the defense in his 16-year career, and the

first time in the United States.

Fire could have consumed body

Special prosecutor Tom Fallon used Fairgrieve and his expertise with fires and burned remains to forward the prosecution's contention that the fire used to dispose of Halbach's body was likely fueled by tires.

Investigators recovered charred bone fragments intertwined in metal strands thought to have originated in a steel-belted tire.

Under cross-examination Fairgrieve said that tires would increase the temperature of a fire and would speed the consumption of a body. Fallon drew the connection to funeral fires from other cultures and the size of the flames needed to consume the body.

Witnesses in the prosecution's case testified seeing a large fire burning behind **Avery**'s garage the night prosecutors contend Halbach was killed.

For fire to consume a human body, it requires between 1½ to 2½ hours at about 1,700 degrees — temperatures well within the range of burning tires, Fallon noted.

Fairgrieve also testified, again under cross-examination, that a body is consumed by a fire faster if it is dismembered, something plausible considering the condition of the remains.

The case against **Avery** resumes Monday when Manitowoc County Circuit Judge Patrick Willis is expected make rulings on three pending motions. **Avery**'s lawyers said the plans for the rest of their defense are dependent in part on the judge's decisions.
