

## **AHA! A LOOPHOLE!**

by Elena Santangelo

*Editor's Note: The feature article in the most recent InSinC, our national newsletter, addresses the "gap between public perceptions about the current state of forensic science and the reality" (i.e., we're getting too much information from CSI). Well, Elena said it first. Here's an excerpt from her September 2004 Belles Lettres article:*

As a mystery reader, I love a twist created by a nice, sneaky loophole in otherwise solid evidence. Problem is, these days, with forensic science taking a lot of human guesswork out of the investigation process, loopholes are harder to come by. I mean, if your forefinger matches a partial found on the gun, you handled the weapon, right?

Not necessarily, says Alexandra Goho, author of "Forensics on Trial" from the March 27, 2004 issue of *Science News*.

For instance, in the early 1980s, the FBI began to use the chemical analysis of bullets to determine if bullet fragments match other bullets in a suspect's possession. They claimed that two chemically identical bullets likely came from the same pot of molten lead, manufactured on the same day by the same company. FBI experts have stated in court testimony that two chemically matching bullets probably came from the same box of ammunition. They've used this technique in more than 2,500 investigations and had the results entered into evidence in more than 500 cases.

When retired FBI metallurgist William Tobin and forensic consultant Erik Randich tested the assertion, they found that:

- A single pot of lead can produce a million-plus bullets;
- The chemical composition of castings from a pot can vary;
- The composition of castings from different pots can match;
- Because bullets are made from smaller blocks of lead sent from refiner to bullet manufacturer, a box of ammunition is likely to contain bullets made from different batches of lead.

The FBI's assertions had never before been scientifically tested for validity,

so no one knew they weren't true. Many other techniques have never undergone significant validity examinations, including tool-mark analysis and yes, even fingerprinting, where we're still using hundred-year-old assumptions. Lack of validation of partial print analysis caused one Philadelphia federal judge to refuse expert testimony in a 2002 case.

So, hopefully, we'll see a rash of forensic validity testing in the near future. Some of our time-honored beliefs might even be disproved. On the flip side, scientific testing might yield new techniques. For instance, if we learn more about the scientific nature of fingerprints—how they fade over time, etc.—perhaps we'll be able to accurately determine the ages of fingerprints at a crime scene.

The lesson a mystery writer can learn here is that experts aren't always experts. Forensics isn't infallible. You can find loopholes where you least suspect.