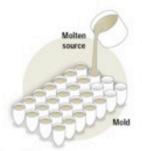
Compositional Analysis of Bullet Lead (CABL)

Bullet-Lead Analysis: No Longer A Smoking Gun

Testing the chemical composition of bullets was thought to be a way to match bullets to their source, allowing the FBI to link bullets to suspects, much as it uses blood type to link evidence to an individual. Accepted as evidence for 30 years in criminal cases, bullet-lead analysis led to many convictions. However, scientific studies starting in 2001 have shown that FBI courtroom testimony about bullet lead is flawed:



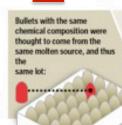
Background: How bullets are made

Lead alloy is melted from leftover car batteries. The liquid is poured into a mold. All bullets poured from the same batch of molten lead are considered to be from the same "lot." Studies estimate that as many as 35 million bullets can come from a single source.

Two assumptions were made about this process, leading to the theory that a single bullet's characteristics would be representative of all other bullets in the lot:

ASSUMPTION 1: The molten source has a uniform composition throughout. ASSUMPTION 2: No two molten sources have the same composition.

The Old Theory: Matching Bullet Composition Equals Shared Source



If crimescene Bullet A had the following chemical makeup And it matched the chemical makeup of Bullet B from a particular box . . .

... And if all members of that lot are assumed to share a unique composition (bullets from other lots would have a different composition because they were from different sources), then Bullet A was assumed to have come from the same lot as bullet B.



CONCLUSION

If a crime-scene bullet matched a bullet from a box, the possessor of the box was considered a likely suspect.

Current Science: Matching Bullet Composition Does Not Necessarily Prove Shared Source



A bullet from the beginning of the pour can have one chemical signature

... A bullet from the middle of the pour can have a different chemical signature ...

... And a bullet from the end of the pour can have yet another signature that does not match

the other two...

Lot 1 1 = 2 = 3

CONCLUSION

A crime-scene bullet may match a bullet from a box, but that does not necessarily mean they came from the same source.

ASSUMPTION 1: The molten source has a uniform composition throughout. FALSE

Composition can vary throughout a pour, allowing bullets of the same lot to differ.

ASSUMPTION 2: No two molten sources have the same composition. FALSE

Compositions can be commonly repeated among different sources or lots.