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Contaminated Evidence

On 24 January, Stephan Cowans was released from prison in Massachusetts, after serving 6 years for the nonfatal shooting of a police officer, becoming the 141st wrongfully convicted person exonerated by forensic DNA testing. Cowans' case is particularly significant because it is the first conviction overturned on DNA evidence in which fingerprint evidence, long considered the gold standard of forensic evidence, was crucial in securing the wrongful conviction.

Cowans was convicted on two seemingly independent lines of evidence: a fingerprint taken from a cup from which the perpetrator drank water, which two fingerprint examiners said matched his, and two eyewitnesses, the victim and another witness.

This case adds more anecdotal support for the already well-established observation that eyewitnesses can make mistakes. And, although wrongful convictions based on fingerprint evidence are not unknown, the authority of DNA evidence in this case demonstrates the fallibility of the presumed infallible technique of fingerprinting.

As Donald Kennedy recently wrote (Editorial, "Forensic science: oxymoron?", 5 Dec., p. 1625), we need to know more about the reliability of forensic evidence. But we think there is more to be learned from this tragic case than merely that eyewitness and fingerprint evidence can fail. The Cowans case also offers lessons about the cross-contamination of evidence.

What went wrong? Was it the fingerprint evidence? The eyewitness identification? We think the blame needs to be placed not merely on one piece of evidence, but on the pernicious interactions between seemingly discrete pieces of evidence.

Cowans' fate was sealed by a series of human decisions. A computer search for a match to the fingerprint on the cup came up empty. Interestingly, Cowans had a criminal record, and his fingerprint was in the database at the time. A few days later, however, a neighborhood canvas made Cowans a suspect. A fingerprint examiner compared the fingerprint on the cup, not with a database of unknowns, but with the print that the examiner knew to come from the suspect. Cowans' print now "matched" the cup.

Fingerprinting is said to be an exact science. But why did Cowans' print not "match" until after Cowans was identified as a suspect? Fingerprint misidentifications are supposed to be prevented by having a second examiner verify the match. But these verifications are not conducted blind. The second examiner typically knows that his or her colleague has made a match. In this case, the second examiner confirmed the erroneous match.

The next key human decisions were those of the eyewitnesses. Presumably, they knew the police had a suspect, and the officer conducting the identification tests presumably knew who the suspect was and that he had been implicated by fingerprint evidence. Did the officer unwittingly communicate this information to the eyewitnesses at the time of their

identification? Did he or she reinforce their identification, thereby artificially inflating their confidence? We know that investigators can inadvertently communicate information to witnesses that biases their choices, and that reinforcing a choice can make the witnesses more confident when they testify at trial and more compelling to a jury (1).

Interestingly, Cowans appealed his conviction on the basis that the victim ought not have been permitted to testify as to his level of confidence in his identification of the perpetrator. (The victim testified that he had no doubt in his identification.) In his appeal, Cowans cited scientific literature indicating the lack of correlation between eyewitness confidence and accuracy. The Appeals Court of Massachusetts dismissed this argument (2).

At each of these key stages, human decision-makers could have been biased, causing them to implicate Cowans when they might not have done so without biasing information. The practical solution to this problem is straightforward (in theory, albeit perhaps not in practice), namely: Keep the investigators blind to the identity of the suspect when they interact with witnesses or fingerprints.

Clinical trials are double blind, and science has much to teach law enforcement about the problem of bias and how to control and correct for it (3). Some progress has been made in introducing blinding procedures to eyewitness identification. But forensic scientists remain stubbornly unwilling to confront and control the problem of bias, insisting that it can be overcome through sheer force of will and good intentions.

The Cowans case is a vivid illustration of the pernicious effects of bias on evidence in criminal investigations. Giving purportedly dispassionate actors in criminal investigations biasing information encourages them to make errors of judgment. Fingerprint examiners see matches that they wouldn't otherwise see. Eyewitnesses who are uncertain suddenly become certain. Their erroneous conclusions are all the more convincing because they are unaware that they have been biased.

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