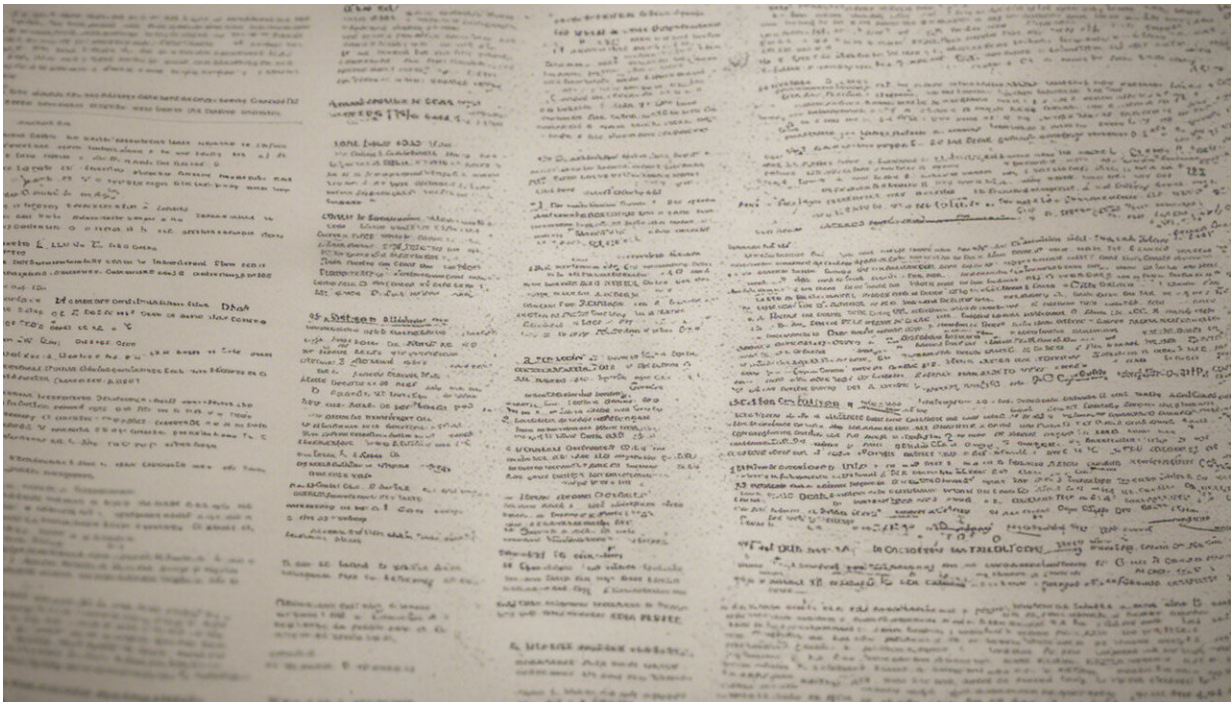


There are question marks over much of the forensic evidence used in our courts

September 28 2016, by Marilyn McMahon



Credit: AI-generated image ([disclaimer](#))

Crime dramas in film and television often focus on the value of forensic procedures in solving crimes and convicting criminals. While this evidence is often portrayed as almost infallible, a [report released this month in the United States](#) raises significant doubts.

The President's Council of Advisors on Science and Technology ([PCAST](#)) concluded that many commonly used forensic procedures lack adequate scientific validation. The procedures include things such as bite-mark analysis, microscopic hair comparisons, firearms identification and footwear analysis.

The report says there is insufficient research that establishes the accuracy and consistency of these procedures.

Given that this [forensic evidence](#) is used in criminal trials in Australia, the report's findings are relevant here, too.

The problems associated with this sort of evidence are most clearly illustrated in relation to a form of forensic evidence of which PCAST was particularly critical: bite-mark identification.

What is bite-mark identification?

This process usually involves comparing a record of [bite marks](#) made by an accused's teeth with a record of a bite mark left on a victim.

Police sometimes use this form of analysis to identify an offender where a victim has been bitten but the prosecution cannot otherwise identify the offender. This could be in cases where the victim did not see or hear the offender, or in a homicide because the victim is dead.

The [use of bite marks](#) for the purpose of identifying offenders has a long history. It was used in the Salem witch trials in 1692 to convict Reverend George Burroughs of witchcraft after his teeth were matched with bite marks on a victim. The case provides a warning: Burroughs was [posthumously exonerated and his family compensated](#) for his wrongful conviction and death.

More recently, cases in 20th-century America have seen bite-mark evidence used to help obtain convictions, including that of [serial killer Ted Bundy](#).

But there is increasing concern about how this identification is done and how accurate it really is. These concerns are highlighted in cases of [wrongful convictions](#).

Wrongful convictions

In several cases in the United States, individuals have had their convictions overturned because they were wrongfully convicted on the basis of bite-mark evidence.

In 1992, [Ray Krone](#) was convicted of murder and sentenced to death, largely on the basis of evidence that matched his teeth to a bite mark on the deceased.

He spent ten years in prison before he was released. His exoneration occurred after DNA on the victim's clothes was matched to another offender.

More recently, [Stephen Chaney was released](#) after spending 28 years in prison following his conviction for a double murder in Texas.

At Chaney's original trial an expert told the jury there was a "[one to a million](#)" chance that someone other than Chaney had bitten the victim. But by 2015 that expert had recanted his testimony and the prosecution acknowledged that the bite-mark evidence was unreliable.

Bite-mark evidence in Australia

Identification based on bite-mark evidence appears to be relatively rare in Australia but it certainly has its supporters. The Australian Federal Police [approvingly notes on its website](#) a case in which bite-mark evidence was crucial:

A sex-attacker punched his victim and then threatened to kill her. In the struggle he bit her on the breast. A forensic odontologist took an impression of the bite mark which later convinced a jury that the accused was, indeed, the attacker. He was convicted and sentenced accordingly.

Bite-mark evidence was also tendered in one of Australia's most controversial criminal cases: the trial of [Raymond Carroll](#) for the murder of an infant in Ipswich in 1973.

A post-mortem examination had revealed bruising on the infant's thigh. Although an initial investigation concluded that it would not be possible to identify an offender on the basis of these marks, three forensic dentists subsequently testified at Carroll's trial in 1985 that the bruising was caused by biting and that the mark matched Carroll's teeth.

These experts also acknowledged the difficulties of bite-mark identification. Carroll was convicted of the murder.

But the Queensland Court of Appeal was sensitive to the problems associated with bite-mark evidence. It [subsequently overturned Carroll's conviction](#) on the basis that the evidence did not provide a reliable basis on which he could have been found guilty beyond reasonable doubt.

Unreliable evidence

Predictably, police and prosecutors have [condemned](#) attempts to restrict reliance on forensic evidence. They claim that this will hamper crime investigation and deprive them of valuable means of identifying

offenders.

But identifications based on scientific procedures that have not been properly validated carry a high risk of causing miscarriages of justice.

PCAST has recommended that further research be conducted to consolidate the scientific bases of forensic procedures such as DNA and latent fingerprint analysis.

However, the commission found that the prospect of developing bite-mark analysis into a scientifically valid method was so low that it advised against devoting significant resources to the task.

Clearly, we must be more discerning in the types of forensic science we admit into courts. The reservations expressed by the appellate court in Carroll's case should be extended. Until research establishes bite-mark analysis (or any other forensic technique) as a valid and reliable procedure, identifications based on this type of evidence should not be admitted in criminal trials in Australia.

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