G4 Bitemark Moratorium Part 1: Past Culture and Present Thinking

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Learning Overview: After attending this presentation, attendees will understand: (1) the failures of bitemark evidence in some of the wrongful conviction cases in the United States, (2) the recommendations made by the Texas Forensic Science Commission, (3) the current scientific research, and (4) a potential outline for empirical bitemark studies as a path forward.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing that the culture and evolution of bitemark thinking has changed greatly since the publication of the National Academy of Sciences Report in 2009 and that the research to support more current bitemark guidelines remains absent.[1] This presentation will illustrate the fundamental issues of bitemarks that require scientific validity and, potentially, how this may be accomplished.

The "comparison sciences"—forensic feature comparison methods in criminal cases in the United States—have come under increased scrutiny and pressure from both the scientific and legal communities. In large part, this is due to the lack of a scientific underpinning, examiner reliability, and validation. Bitemarks are included in the category of subjective feature comparison methods that are based on examiner interpretation and experience. Three independent scientific panels—the National Academy of Sciences (NAS), the President's Counsel of Advisors on Science and Technology (PCAST), and the Texas Forensic Science Commission (TFSC)—have all concluded that there are no scientific studies that validate examiner reliability or establish accuracy of bitemark analysis and comparison methods.[1-3] Proficiency testing is essential for all fields of forensic science, yet remain absent in bitemark analysis and comparison methodology. Calculation of an error rate is essential for assessing probative evidentiary forensic value in criminal cases in which an individual's life, placement of minor children, and liberty is at stake.

In April 2016, after a six-month investigation by the TFSC, the panelist of scientists and attorneys recommended a moratorium on bitemarks in criminal cases in the state of Texas pending further research demonstrating sufficient examiner reliability and validity. The commission's decision was a result of a comprehensive review of the past and current bitemark literature as well as testimony heard from several American Board of Forensic Odontology (ABFO) Diplomates and others within the scientific community. The shockingly poor results of one study constructed to examine the most basic aspect of bitemarks and to assess levels of agreement in determining if patterned injuries in skin were made by teeth or not captured the attention of the Commission. If there are not reliable criteria to define a pattern injury as a bitemark, then trying to analyze and compare the pattern to suspect dentitions cannot be scientifically supported.

The number of wrongful convictions and indictments based on bitemark evidence in the United States currently stands at 31. Some believe the ABFO has addressed the underlying failures of these cases by changing their standards and guidelines accordingly. This may be a good first step. However, in a recent 2018 editorial in the *Journal of Pathology and Medicine*, several authors wrote: "Understanding the causes and attempting to clarify where, how, and why the wrongful convictions occurred is necessary to be able to take measures to reduce the likelihood of such failures from happening again."[4] This is a worthy goal that can only be partially fulfilled by looking backward at errant cases. The NAS Report and the independent scientific panels have said that there needs to be scientific data to support the recognition, analysis, and, where appropriate, comparison of bitemark patterns' attribution to suspect dentitions.

This presentation will address some of the bitemark evidence and expert testimony in four recent wrongful convictions, review the current status of bitemark methodology, and outline a potential science-based path forward.

Reference(s):

1. Committee on Identifying the Needs of the Forensic Science Community, National Research Council of the National Academies. *Strengthening Forensic Science in the United States: A Path Forward.* Washington, DC: The National Academies Press, 2009.
2. The President's Council of Advisors on Science and Technology (PCAST) Final Report. *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods.* September 2016.
3. The Texas Forensic Science Commission. *Forensic Bitemark Comparison Complaint Filed by National Innocence Project on Behalf of Steven Mark Chaney—Final Report.* April 12, 2016
4. Barsley, Robert, E., DDS, JD; Bernstein, Mark, L., DDS; Brumit, Paula, C., DDS; Dorion, Robert, B.J., DDS; Golden, Gregory, S., DDS; Lewis, James, M., DMD; McDowell, John, D., DDS, MS; Metcalf, Roger, D., DDS, JD; Senn, David, R., DDS; Sweet, David, OC, DMD, PhD; Weems, Richard, A., DMD, MS. Epidermis and Enamel: Insights Into Gnawing Criticisms of Human Bitemark Evidence. *The American Journal of Forensic Medicine and Pathology* (June 2018) Volume 39, Issue 2: 87–97

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