

**A Legal, Scientific and Phenomenological
Enquiry into the Reliability of Bitemark Analysis**

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A thesis submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy

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March 2012

Statement of Originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

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Date:

Acknowledgements

This thesis would not have been possible without the support of many people, and I must firstly thank my supervisors, Associate Professor Jane Taylor and Dr Matt Blenkin, whose encouragement and guidance have made this journey all the more easier.

I would also like to thank those people who agreed to spend time discussing various aspects of this work and their significance, both on and off the record. I acknowledge their time and patience in educating someone who must have seemed no more than a rank amateur in the finer points of their own complex academic realms. In particular, I would like to thank Associate Professor Simon Cole, Judge Stephanie Domitrovich, Robert Epstein, Professor David Faigman, Professor Ian Freckelton SC, Associate Professor Gary Edmond, Justice Michael Kirby AC CMG, Judge Barbara Rothstein, and Professor Michael Saks in this regard. Thanks also go to Dr Mike Bowers and Dr David Sweet for the time they spent discussing various aspects of this research with me.

I must also thank each of the Australian odontologists who participated in this research, for their time but also their frank, open and honest discourse during interviews. Without their participation, this project would certainly not have been possible. Thanks also go to the directors of those odontology centres who were approached regarding access to their bitemark case records, for their overt willingness to provide data in this manner.

Finally, my heartfelt thanks go to Mark, who never seemed to doubt that I could do it.

To the innocent

Abstract

Bitemark analysis has anecdotally been used for centuries to identify the perpetrators of violent crimes. Despite its long-standing use in courts across the Western world, the advent of new technologies in forensic science such as DNA analysis has drawn to light numerous examples where innocent men have been convicted of such crimes on the basis of bitemark interpretation by one or more experts. The legal sphere saw the introduction of arguably the most restrictive limitations on expert testimony in the United States in 1993, via the US Supreme Court case *Daubert v Merrell Dow Pharmaceuticals Inc.* Yet the extent to which this precedent is adhered to, which calls for assessment of a discipline's *reliability* prior to admission as evidence, even in the United States appears minimal. Judges are generally loath to exclude most long-standing forensic identification techniques, including that of bitemark analysis, despite criticism from numerous fronts that many if not all of these disciplines fail to meet any standards articulated by the *Daubert* precedent.

Despite the urging of legal and scientific academics, and despite the obvious similarity to those forensic techniques used in the United States, Australian courts have categorically rejected the relevance of *Daubert* to expert evidence in this country. The liberal admission of expert testimony appears to be a most jealously guarded facet of our legal system. Australia does not appear likely to adopt precedents that in any way give judges the authority to exclude expert testimony on the grounds of a failure to meet a reliability threshold, particularly when the witness currently meets the requirements for admission as an expert under the relevant sections of the Evidence Act.

Yet the answer to whether bitemark analysis is justified, as both a science and tool by which the courts can use for forensic identification purposes is not as straightforward as it seems. The literature supporting the ability of individuals to claim identity from marks made by teeth on human skin is very weak, and combined with a growing history of wrongful convictions from analysis in this manner seems to clearly suggest that the answer to this question is 'no'. Yet there is also need to assess whether these wrongful conviction cases are indeed reflective of the practice that most odontologists necessarily engage in this country. Anecdotal evidence suggests that these forms of conclusions are comparatively rare in Australia, and retrospective analysis of casework supports the notion that only a relatively small percentage of such cases end in conclusions regarding individual identity.

Bitemarks potentially reveal more information regarding the nature of the perpetrator than simply identity, and so their interpretation still plays a useful role in forensic evidence

investigations even if not used for that ultimate purpose. Yet even when interpreting injuries without specific regard to identification of the perpetrator, odontologists in Australia have demonstrably drawn conclusions that remain unsupported by any evidence that they are indeed justified. This is perhaps partly due to the lack of objective standards by which bitemarks are assessed, and is further fuelled by the liberal acceptance of expert opinion in Australian courts.

Yet expert opinion can be no substitute for logical conclusion. Patterns of admission of expert evidence, at least in Australia, are unlikely to change in the near future, and so we are left with little option but to try and modify the conduct of bitemark analysis so that it remains within the bounds of credible science. Despite the legal fraternity being reluctant to restrict the scope of forensic identification science testimony, including that of bitemark analysis, the odontology profession cannot remain blind to the fact that there are severe flaws in the practice of bitemark analysis and its subsequent interpretation that need to be addressed. Many of the problems that lead to the inherent ‘unreliability’ of bitemark analysis can only be addressed by long-term research projects, and so defining these boundaries of credibility is of prime importance at the current time. Odontology is best served in the immediate term by recognising the limitations associated with the practice of bitemark analysis as a united professional body, before other agencies make potentially damning decisions that we will have little influence over, and which may ultimately lead to the demise of our role as forensic investigators.

Publications

Several chapters of this thesis were abridged and published as separate papers during the preparation of this thesis, and are included following the Appendix:

Chapter 3:

Page, M., Taylor, J.A. & Blenkin, M. (2011) Forensic Identification Evidence Since Daubert Part I - A Quantitative Analysis of the Exclusion of Forensic Identification Science Evidence. *J Forensic Sci*, 56(5), 1180-1184

Page, M., Taylor, J.A. & Blenkin, M. (2011) Forensic Identification Evidence Since Daubert Part II - Judicial Reasoning in Decisions to Exclude Forensic Identification Science Evidence on Grounds of Reliability. *J Forensic Sci*, 56(4), 913-917.

Chapter 5:

Page, M., Taylor, J.A. & Blenkin, M. (2011) Uniqueness in the Forensic Identification Sciences - Fact or Fiction? *Forensic Science International*, 206, 12-8

Chapter 7:

Page, M., Taylor, J.A. & Blenkin, M. (2012) Reality Bites — A ten-year retrospective analysis of bitemark casework in Australia. *Forensic Sci Int*, [In Press], Available online [Early view]

Page, M., Taylor, J.A. & Blenkin, M. Expert Interpretation of Bitemark Injuries – A Contemporary Qualitative Study [Accepted for Publication Apr 2012] *J Forensic Sci*

Chapter 8:

Page, M., Taylor, J.A. & Blenkin, M. (2012) Context Effects and Observer Bias - Implications for Forensic Odontology. *J Forensic Sci*, 57(1) 108-112

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5. Page, M., Taylor, J.A. & Blenkin, M. (2012) Context Effects and Observer Bias - Implications for Forensic Odontology. *J Forensic Sci*, 57(1) 108-112
6. Page, M., Taylor, J.A. & Blenkin, M. Expert Interpretation of Bitemark Injuries – A Contemporary Qualitative Study [Accepted for publication, April 2012]. *J Forensic Sci*.