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

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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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Mark Andrew Page                     Date:
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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:


Chapter 5:

Chapter 7:

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:
Table of Contents

Introduction ......................................................................................................................... 1
Consequences of Invalid Forensic Science ........................................................................ 4
Forensic Odontology ........................................................................................................... 6
Problem Statement ........................................................................................................... 7

1. Research Methodology ............................................................................................... 8
   Researching ‘Reliability’ ................................................................................................. 8
   Architecture .................................................................................................................. 10
      Legal Enquiry .............................................................................................................. 10
      Scientific Enquiry ....................................................................................................... 10
      Phenomenological Enquiry ......................................................................................... 11
   Phenomenological Analysis – Grounded Theory .......................................................... 12
   Phenomenological Data Collection .............................................................................. 15
      Expert Interviews ......................................................................................................... 15
      Retrospective Casework Analysis .............................................................................. 20

2. The Admissibility of Expert Evidence: Frye, Daubert and the US Federal Rules of
   Evidence ......................................................................................................................... 23
      General Acceptance and the Frye Standard .................................................................. 24
      The US Federal Rules of Evidence .............................................................................. 26
      Daubert v Merrell Dow Pharmaceuticals Inc. .............................................................. 27
      Responses to Daubert ................................................................................................. 29
      Relevancy, Review and Joiner ..................................................................................... 33
      Scope of Applicability and Kumho Tire ....................................................................... 35
      Expert Evidence in the United States Today ............................................................... 37

3 Forensic Identification Evidence Since Daubert ........................................................... 43
   The Admission of Forensic Identification Evidence ...................................................... 45
      Empirical Data on the Admission versus Exclusion of Forensic Identification Science
      Evidence ....................................................................................................................... 51
   The Exclusion of Forensic Identification Evidence ....................................................... 53
      Methodology ............................................................................................................... 54
      Results ........................................................................................................................ 55
         Quantitative Analysis ............................................................................................... 58
         Qualitative Analysis: Reasons for Failing to Meet the Reliability Threshold .......... 61
   Discussion ...................................................................................................................... 71
   Conclusion ..................................................................................................................... 76

4. Australian Evidence Law and the Admissibility of Scientific Expert Evidence ...... 78
   Australian Evidence Law ............................................................................................... 78
   The Admission of Scientific Evidence in Australia ....................................................... 82
   Commentary on Expert Scientific Evidence in Australia .............................................. 88
   The Daubert Trilogy in Australian Law ......................................................................... 92
   Conclusion ..................................................................................................................... 100

5. Uniqueness and Individualisation in Forensic Science ................................................. 102
   The Uniqueness Fallacy ............................................................................................... 102
   The Ideological Origins of the Uniqueness Principle .................................................... 104
   The Evidence for Uniqueness ....................................................................................... 106
      Anecdotal Evidence and Experience ........................................................................ 106
Knowledge about the process of formation ........................................... 108
Studies .............................................................................................. 109
Quantifying Uniqueness: The problem of numbers ................................. 119
The (Il)logic of the Uniqueness Literature .......................................... 123
The Irrelevance of Uniqueness .............................................................. 127
Conclusion ......................................................................................... 132

6. A Critical and Contextual Evaluation of Bitemark Analysis ................. 134
   Literature Concerning the Collection and Analysis of Bitemark Evidence 140
   Interpretation of a Suspected Bitemark Injury ................................... 145
   Effect of Quality of Injury on Assessment ......................................... 148
   Reporting – Agreement in Language and Semantics ........................... 150
   Error and Accuracy Rates in Bitemark Analysis ................................. 158
   Conclusion ......................................................................................... 167

7. Bitemark Analysis in Contemporary Australia .................................... 168
   Results .............................................................................................. 169
   Experience in Forensic Odontology .................................................. 169
   Post-graduate qualifications in Forensic Odontology (at time of interview) 170
   Courtroom Experience in Presenting Bitemark Evidence .................. 170
   Case Type ......................................................................................... 171
   Quality .............................................................................................. 172
   Method of Analysis of Bitemarks ....................................................... 173
   Consistency of Opinions .................................................................. 175
   Assessment of the Forensic Value of Bitemarks ................................. 188
   Agreement on Origin of Injury ........................................................... 190
   Reporting – Conclusionary Language and Semantics ........................ 191
   Discussion ......................................................................................... 194
   Experience and Qualifications .......................................................... 194
   Quality .............................................................................................. 195
   Methods of Analysis ......................................................................... 196
   Odontologist Agreement .................................................................. 198
   Severity and Significance Scoring: ‘Forensic Value’ Analysis ............ 203
   Bitemark Reporting ......................................................................... 205
   Conclusion ......................................................................................... 209

8. Contextual Effects and Observer Bias In Forensic Odontology ............ 210
   The Bias Blind Spot ........................................................................ 211
   Context Effects ................................................................................ 215
   Emotional effects ............................................................................ 215
   Confirmation bias ............................................................................ 215
   Target shifting ................................................................................ 216
   Other Sources of Cognitive Bias ....................................................... 217
   Observer Effects ............................................................................ 217
   The Contrast Effect .......................................................................... 218
   The Overconfidence Effect ............................................................... 221
   Minimising Cognitive Bias ............................................................... 223
   Conclusion ......................................................................................... 229

9. Conclusion ....................................................................................... 230
   Is Daubert Relevant? ...................................................................... 230
   The Scientific Status of Bitemark Analysis ....................................... 232
Bitemark Analysis – Contemporary Australian Practice ........................................233
Nature of casework .........................................................................................234
Quality of Evidence .........................................................................................234
Interpretation of Bitemark Injuries .................................................................235
Method of Analysis .........................................................................................236
Standard of Reporting .....................................................................................237
Language ........................................................................................................238
Potential for Bias .............................................................................................240
The Future .......................................................................................................241
References .......................................................................................................243
Appendix: Guidelines for Bitemark Analysis ..................................................268
Publications:


