

Commentary on: Bottrell MC, Webb JB. Review of: *Forensic Interpretation of Glass Evidence*. J Forensic Sci 2002;47(4):926–7.

Sir:

As keen advocates of the Bayesian approach to the evaluation of evidence, we welcomed the publication of the book on the *forensic interpretation of glass evidence* by Curran et al. (1) and were disappointed by the review by Bottrell and Webb (2). Our welcome was because the book brings together in one publication the excellent material provided by the contributors over several years for the evaluation of evidence in general and glass evidence in particular. Our disappointment was because the reviewers emphasized some small shortcomings in the presentation of the material and ignored many good points in the content.

The reviewers do not provide a chapter-by-chapter summary so we will do so. The first chapter is a description of the methods for glass examination. Chapter 2 provides a review of what the authors call the conventional approach to evidence interpretation though we would prefer the description “frequentist.” This is followed in Chapter 3 by a description of the Bayesian approach. Chapter 4 describes glass databases and how data on glass are collected. Chapter 5 describes transfer and persistence studies and this is followed in Chapter 6 by a description of statistical tools and software and in Chapter 7 by a description of how glass evidence may be reported. These are important subjects and the principles apply not just to glass but also to many other types of transfer evidence. The comparison of frequentist and Bayesian approaches is well done. The listing of assumptions in Chapter 2 and the careful distinction drawn between a probability density and a probability in Chapter 3 are both important contributions to the debate on evidential value. Graphical models are an expanding area in evidence evaluation though they were first introduced in forensic science some time ago (3). Their publication here in Chapter 5 for the assessment of transfer probabilities is welcome. Graphical models provide a stimulus to the debate to which it is easy for forensic scientists to contribute because the factors and associations involved are expressed very clearly.

Unfortunately, the reviewers tell the readers little of the importance of graphical models. For example, their criticism 5 is concerned with the omission of a definition for w_i , but mentions nothing of all the other (35) variables which are defined, nor of the inter-relationships (45) that are described, nor of the suggestions that are made for the distributions (20) of some of the variables. Transfer and persistence are important aspects of evidence evaluation and the diagrams in Chapter 5, as we wrote above, provide valuable material for an informed debate on their role. It is also pertinent that the reviewers, misleadingly, call the diagram on p. 129 a flow chart whereas the correct name is a graphical model.

Criticism 7 is concerned with the failure of the authors to consider grouping for a set of four observations. It may indeed be the case that a formal application of the grouping procedures allocates the observations to “at least two” groups as the reviewers claim. We question whether it is meaningful to apply such procedures to a number of fragments as few as four.

The other criticisms are more valid, though not critical. Criticism 4 relates to an unfortunate mistake in the calculation of probabilities which may cause confusion among those who are struggling with probability. The other four criticisms relate to factual inaccuracies that are of minor consequence in the context of the general message of the book. For example, we wonder whether in a book on *interpretation*, it is important to criticize the authors for not describing problems that may arise in the *identification* of particles as glass.

The reviewers claim this is not an instruction manual. The authors say they are trying to provide statistical tools and methodology. The reviewers also claim that this book is not an impartial critical review and that such a review would better serve the forensic science community. This book is a critical review. It is not impartial but then it cannot provide tools and methodology if it leaves the scientist wondering which tools and methodology to adopt. It is made quite clear that the Bayesian approach is the best approach to adopt and why this is so. Full implementation of the ideas in this book will require considerable work. However, this work will be amply rewarded by a greater understanding of the complexities of the evaluation of many kinds of transfer evidence, not just glass.

References

1. Curran JM, Hicks TN, Buckleton JS. *Forensic interpretation of glass evidence*. CRC Press, Boca Raton, Florida, London, New York, Washington, DC. 2000.
2. Bottrell MC, Webb JB. Review of: *Forensic interpretation of glass evidence*. J Forensic Sci 2002;47:926–7.
3. Aitken CGG, Gammerman A. Probabilistic reasoning in evidential assessment. J Forensic Sci Soc 1989;29:303–16.

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