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BOOK REVIEW

C. E. Buck, W. G. Cavanagh and C. D. Litton. *Bayesian Approach to Interpreting Archaeological Data.* Chichester, England, J. Wiley and Son, 1996: 382 p. ISBN 0-4719619-7-3.

Bayesian Approach to Interpreting Archaeological Data is intended for undergraduate and postgraduate students of archaeology and for professional archaeologists and members of related disciplines. The authors explain the basic rationale of the Bayesian approach in archaeological investigation, highlight its advantages and illustrate the range of archaeological problems that lend themselves to a Bayesian approach. The volume is one of the Wiley "Statistics in Practice" series, which covers statistical concepts, methods and worked case studies.

The book is divided into two main sections. Chapters 1–8 cover the principles underlying the Bayesian approach and practice, including the Bayesian approach to statistical archaeology, modeling in archaeology, quantifying uncertainty using probability concepts, statistical modeling with some material on distributions, Bayesian inference and finally implementation issues (which I think could easily be skipped by the archaeological reader; Bayesian methods very often tend to be computationally intensive and this chapter explores some of the technical difficulties). The examples include provenancing and seriation, tree-ring and radiocarbon dating and spatial analysis. The next four chapters provide a series of detailed case studies, one to a chapter: "Interpretation of Radiocarbon Results", "Spatial Analysis", "Sourcing and Provenancing" and "Application to other Dating Methods". Each chapter is made up of a number of archaeological case studies, which are presented in a consistent manner, with a clear discussion of the archaeological context of the problem, followed by discussion of the statistical model, data, prior, likelihood, posterior and then conclusions. It is perhaps not obvious exactly what the gains are from having completed a Bayesian analysis, nor is the effort involved in eliciting and quantifying prior information demonstrated.

The book is very thorough, but a reader hoping for some simple recipes to apply would be disappointed, because they may not exist. There is no intention that the archaeologist should now be able to perform the analysis unaided. Currently, Bayesian analysis requires a specialist statistical knowledge, but the book explains the ingredients and some of the terminology that a collaborating statistician will use. The authors state clearly at the end of the text that each problem must be tackled afresh, although following the same general principles. The book is liberally scattered with many examples and case studies that should offer the archaeologist both familiarity and enhanced understanding.

The final chapter, entitled "The Way Forward", lists some requirements on both the archaeological and statistical communities and makes a plea for proper resourcing of statistical analysis following major archaeological explorations.

The book provides interesting material for the more numerate archaeologist (but at postgraduate or professional level). Bayesian analysis is becoming more and more popular and this book will encourage that interest. The problem of implementing the approach still remains; principles are necessary but the practice is still not at the stage of "off-the-shelf" analysis.

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