

REVIEWS

Time, Energy and Stone Tools, edited by Robin Torrence.
Cambridge University Press 1989. 124pp, price £27.50.

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It is hard to do justice to this work. The collection of eleven papers covers a wide geographical spread, and while principally concentrating on hunter-gatherer case studies, it is not exclusively concerned with any particular chronological period. The main theme is the use of lithic evidence to study human behaviour. As such, the articles attempt to apply innovative theoretical approaches to specific cases. While there is much detail to disagree with, the book is an exciting development in the use of lithic analysis and it is to be hoped that it will act as a catalyst for debate. This review will not describe each paper, but will attempt to examine some of the issues raised.

The first, and most important, is that raised by Torrence. Despite their abundance in the archaeological record, stone tools

do not currently contribute as much as they should to the study of past human behaviour. Although artefacts are the main form of archaeological data, most theoretical models have been borrowed from either anthropology or ecology, and do not adequately consider material remains. It is suggested that, while sophisticated methods of analysis have been developed, there is no theoretical basis that would allow the increasingly detailed information concerning stone tools to be of general value. This position is in contrast to Rowley-Conwy's contention that lithic analysis cannot offer as much as ecological data because of lack of method (1987). As Torrence points out, there is no shortage of methods available for lithic analysis, but there are problems with making use of the quantities of data generated by those methods. To use this data a theoretical framework is required, and the approach followed in most of the articles is to use optimisation theory.

Because the authors are looking at general causes underlying lithic variability, Torrence suggests that

'Perhaps now stone tools might be worth snatching from the grasp of the specialists who control their study and restored to their rightful place in the centre of archaeological studies of past human behaviour'.

Few would argue with the last part of this statement, and most would agree that we should be attempting to ensure that material culture evidence (of whatever type) can be used to study human behaviour, and not simply catalogued in greater and greater detail. The first part of this statement is, however, rather peculiar. It is perhaps born out of the growing specialisation in archaeology that forces people to work in increasingly narrow spheres. Most analysts of lithic material do not consider themselves to be simply lithic specialists, on the fringes of archaeology, but researchers who are attempting to make use of the available data. Indeed, it would be more true to say that lithic analysis has been made peripheral by those who do not study stone tools, and at best send their collections of lithic material to a specialist to produce a contribution that will be included as an appendix to a site report. Torrence uses rather dismissive tones when she describes the Lithic Studies Society as 'a group composed of experts who specialise in the descriptive publication of chipped stone assemblages'. It would appear that those who describe stone tools are uninterested in general archaeology.

With this in mind, it can be stated that the basic premise of the introduction is exaggerated. There have, of course, been attempts to use lithic evidence to elucidate wider archaeological problems, a glance at the bibliography of this volume is ample documentation of this. In addition, the battery of methods built up over the last twenty years has been a necessary precursor to enable lithic evidence to be used to answer increasingly sophisticated questions. In fact, one of the problems with the papers presented here is the lack of attention to 'data quality'

and some of the theoretical assumptions made (Jochim, 107). Many of the methodological developments that have been made are ignored, although these are fundamental for lithic analysis.

This is the major criticism of the book as a whole, that it over-simplifies much of the data. Myers, for example, assumes the function of an entire class of artefacts (microliths) from a few reconstructions of projectile points. Myers' paper is perhaps the best and worst of the collection. He reminds us how little stone tools are used in the reconstruction of hunter-gather subsistence, settlement and mobility compared with the use made of the rare surviving organic evidence, and points out

'the inherent interpretative and quantitative limitations which arise through constructing models that owe so much to so little of the available archaeological record'.

He demonstrates how it is possible to use the lithic evidence in conjunction with environmental data through optimisation theory, producing a unified hypothesis. Unfortunately, his over-simplification of each component of that integrated model means that the whole rests upon very shaky foundations.

In addition, the importance of 'style' is largely ignored in this book. Only the paper by Gero focuses on this issue, pointing out that artefacts are frequently seen as playing a passive role:

'they follow from and directly reflect their ambient prehistoric environments and behaviours. It is only incidentally that the forms or 'styles' of these artifacts might reflect patterns of relationships between individuals or groups.'

She points out that the makers of the artefacts can be active, using 'material culture not only to subsist but also to form, maintain and transform social relationships', consciously or unconsciously. The use of optimisation theory in the other papers generally ignores this dimension and proceeds in a very utilitarian manner. This is an area where optimisation theory perhaps inevitably falls down. The theory assumes that behaviour is designed to optimise the expenditure of time and energy, balancing the costs of a solution against the resulting benefits. The studies tend to assume a single primary 'currency' to be optimised, whether it be energy, time, raw material, or the minimisation of risk, and fail adequately to consider the full interplay of different pressures. This is a shame, as optimisation theory should ideally allow the different goals of different forms of behaviour to be studied in a comparable fashion. This includes not only technology with subsistence, settlement pattern and so on, as suggested by Torrence, but also the different goals that could be achieved through different aspects of technology, including material conservation and risk avoidance. In addition, social goals such as expressing ethnicity and pressing personal advantage could be included.

A similar problem can be observed with Hayden's paper. He suggests that tool morphologies are the result of resharpening and use, and not the product of preconceived forms. 'Mental templates' are thus governed by functional and hafting needs not by finished shape. This general principle is based upon ethnographic research, largely on Australian Aboriginals and New Guinea Highlanders. Related to this is Torrence's observation that British Neolithic tools are a 'typologist's nightmare', and have extreme variability. Hayden acknowledges that his model may not cover ritual or status tools, such as plano-convex knives or arrowheads in the Neolithic. It may also be inappropriate for the preceding Mesolithic and Palaeolithic tools which have greater morphological regularity. Torrence notes that lithics in Australia from the last thousand years are also less regular than their predecessors. It can perhaps be suggested that Hayden's 'general principle' is based upon modern societies that have more in common with the Neolithic than the Palaeolithic.

While blade industries may be more economical of raw material than flake industries, Hayden sees them as less suitable for resharpening and perceives a growing need of quantity of material through time, largely met by the development of resharpening techniques. Torrence also notes the use of low quality material in the Neolithic, extending the quantity of material available, and argues that quality is not so important as the tool kit is no longer as vital in meeting risks as in hunter-gatherer societies. Alternatively (following Gero) it could be argued that for Mesolithic and Palaeolithic groups 'form' was important and that resharpening was not therefore an option, necessitating blade technology for economy. For specific tools in recent prehistory, notably those with high visibility such as projectile points, form may have been equally important for symbolic reasons. A more complicated pattern of both functional and stylistic motives lies within most assemblages than either Hayden or Torrence admits.

All this needs, of course, to be put into perspective. The work presented here is primarily a demonstration of the application of theory to make lithic evidence more generally valuable. In this regard the work succeeds admirably.

The concluding paper by Jochim is a very useful contribution, as it puts some perspective on the rest of the book. He points out that there are many problems remaining for the application of evolutionary theory to lithic technology and lists the main flaws.

1. The probability that not all parts of stone tool technologies will be equally sensitive indicators of complex aspects of human behaviour.
2. The sometimes inadequate quality of data, for example the scant attention paid to function, to distinguishing edge-damage from use and post-depositional factors, or to differentiating between retouch and resharpening.

3. The problems of defining the currency to be optimised: little ethnographic work exists to provide comparative material. It is difficult to determine which factors are important for economising in different circumstances.

4. The difficulty of deducing technological results from a single determinant: it is possible to argue from first principles for a number of possibly conflicting responses to the same situation.

This is in many ways the most exciting book on stone tools and archaeology to be published in recent years. As Torrence points out, tool using is one of the major distinguishing aspects of human behaviour, and the study of those tools is crucial to our understanding of human development. The book deals with the definite, albeit exaggerated, problem of how to use the data available from stone tools. The theoretical models used allow modern sophisticated methods of lithic analysis to become more immediately useful, but at times this work fails to make adequate use of those methods and over-simplifies the data. This is perhaps the result of the perceived gulf between those who use the methods and those who use the theories. Instead of simply pointing to this gulf, more would perhaps be gained if it were appreciated that, while methods are limited in a theoretical vacuum, theories are pointless if they treat the data in a superficial manner. It is impossible to understand possible pressures for optimisation if the technological solutions and functional needs cannot be measured. Fortunately it is possible to study these areas, but few of the authors here do so, tending to assume much and arguing from first principles.

For both the methodological over-simplification and the theoretical problem areas an increasing use of a multiple approach, using several strands of lithic evidence and independent non-lithic, for example environmental, evidence will allow the approaches outlined in this book to become truly useful and allow lithic analysis to contribute directly to core theories concerning human behaviour. Myers indicates how this work should develop, but is thwarted by the problem that each strand is a complicated phenomenon in its own right, and cannot be validly over-simplified when incorporated into the whole. This problem of integrating the many disparate forms of archaeological evidence now available is not restricted to lithic analysis. The development of optimisation theory for tools and material culture does, however, present a means of examining these aspects of the evidence under a unified theoretical framework.

Bill Finlayson January 1990

REFERENCE

Rowley-Conwy, P., 1987, 'Animal bones in Mesolithic studies: recent progress and hopes for the future', in Rowley-Conwy, P., Zvelebil, M., and Blankholm, H.P., (eds), Mesolithic North-west Europe: Recent Trends (Sheffield, Department of Archaeology and Prehistory), 78-81

Archaeology and Landscape Studies in North Lincolnshire, edited by Patricia Phillips. B.A.R. 208, 1989, 2 volumes. Price £24.00. Vol. 1, 'Excavations at North Lincolnshire Long Barrows', 201 pp, 54 figs., 18 tables, 13 plates. Vol. 2, 'Aerial and Surface Survey on the Lincolnshire Wolds and Excavation at Newton Cliffs, North Lincolnshire', 181 pp., 38 figs, 24 tables, 4 plates.

While potentially united by their geographical location, the studies presented in these two volumes are essentially independent and, as no overall synthesis or discussion is attempted, require almost totally independent review.

Volume I deals with excavations carried out at three long barrows: Hoe Hill, Ash Hill and Top Buildings, although, as the last is demonstrated (in chapters 12 and 14) not to be a long barrow, it does not even appear on the overall site location map.

The volume therefore essentially details the excavation of ditch sections across two long barrows which appear on the basis of Figure 1.1 to be fairly close together. As a more detailed map showing the relationship of the two barrows has been replaced by a somewhat strange topographical sketch, just how close must remain a mystery.

The volume would have been a lot simpler to use if two individual excavation reports, each with its descriptive finds, environmental and dating sections, had been presented, followed where appropriate by comparative discussion sections. As it is, the fifteen chapters deal with the individual excavations and a series of reports on the artefacts and environmental aspects. For such a structure to be easily used requires considerably more cross-referencing than is available here. What appears more illogical, however, is an imbalance which gives prominence to aspects of the investigations which could be considered almost totally irrelevant, at the expense of important data, such as the radiocarbon dates for the barrows, some of which is hidden away and really takes some finding.

To dismiss some sections as irrelevant might seem unduly harsh. However, when the circumstances of the discovery of two partial unstratified skeletons, which subsequently turn out to be of Viking date, and the accompanying bone report run to seventeen pages when a note would have sufficed, the comment seems fair. This sort of information should be summarised with the rest left firmly in the archive.