contrasts which seem so important. If there really are no vast spreads of material in this area, then here we have a most interesting distinction from other regions which have been studied in depth. It is difficult to say more from the text but the catalogue suggests that this distinction may be genuine. Although Late Neolithic domestic sites in the region include more tool-types than earlier assemblages, as has been demonstrated elsewhere, the range is nowhere near as wide as it is in any of the areas mentioned above and tool variability amongst individual collections is unusually low. This is a point which urgently needs further consideration.

I regret to say that I think Dr Holgate, despite the great deal of work he has obviously put into his research, has been unable to see the wood for the trees. This report does not do justice to the amount and importance of the data he has collected and whilst it may go some way towards reconstructing settlement patterns in the Thames Basin, it does little to aid our understanding of them. The economic model is interesting, but a closer look at evidence from within the British Isles would have provided a much more relevant and focused background to the region than many of the continental cultures referred to.

Once upon a time BARs were cheap and one could afford to buy volumes such as this for the catalogue and the better bits. At £24 my advice would be to borrow this one from a library.

Julie Gardiner, January 1989

Stone Axe Studies Volume 2, the Petrology of Prehistoric Stone Implements from the British Isles, edited by T.H. McK. Clough and W.A. Cummins. C.B.A. Research Report 27, 1988, 297 pp., 42 figs, 23 maps, 40 tables, price £35.

and

Stone Axe Morphology and Distribution in Neolithic Britain, by Sylvia Chappell. B.A.R. 177, 1987, 2 vols, 684 + xvii pp., 126 figs, 49 tables, price £35.

Almost half of Stone Axe Studies 2 is made up of a list of the available petrological identifications of prehistoric or apparently prehistoric implements from Britain, accompanied by nationwide distribution maps of implements of each petrological group. This pulling-together of information either previously unpublished or dispersed among many sources is one of the volume's most useful features now, and will ensure that it remains a valued work of reference for many years to come. A major achievement of the volume is that it presents information from Scotland, Cumbria and Northumberland for the first time. Congratulations are due to the editors, the C.B.A. and the Royal Commission on the Historical Monuments of England, whose computerised record of identifications, will, one hopes, be systematically maintained.

These data are preceded by an admirable introduction by Clough, and by the following papers:

1. Fenton, M.B., and Travis, R.J.A., 'A method for taking petrological samples from stone implements'

2. Davis, R.V., Howard, H., and Smith, I.F., 'The petrological identification of stone implements from south-west England: sixth report'

3. Woodcock, A.G., Kelly, D.B., and Woolley, A.R., 'The petrological identification of stone implements from south-east England'

4. Clough, T.H. McK., and Cummins, W.A., 'The petrological identification of stone implements from London and Middlesex'

5. Green, B., 'The petrological identification of stone implements from East Anglia: second report'

6. Cummins, W.A., and Moore, W.R.G., 'The petrological identification of stone implements from the south-east Midlands'

7. Clough, T.H.McK., and Cummins, W.A., 'The petrological identification of stone implements from the east Midlands: third report'

8. Shotton, F.W., 'The petrological identification of stone implements from the west Midlands: third report'

9. Phillips, P., Cummins, W.A., and Keen, L., 'The petrological identification of stone implements from Yorkshire: second report'

10. Coope, G.R., Robinson, D.J., and Roe, F.E.S., 'The petrological identification of stone implements from Lancashire and Cheshire'

11. Coope, G.R., and Garrard, L.S., 'The petrological identification of stone implements from the Isle of Man'

12. Fell, C.I., and Davis, R.V., 'The petrological identification of stone implements from Cumbria'

13. Cummins, W.A., and Harding, A.F., 'The petrological identification of stone implements from north-east England'

14. Ritchie, P.R., and Scott, J.G., 'The petrological identification of stone axes from Scotland'

15. Fenton, M.B., 'The petrological identification of stone battle-axes and axe-hammers from Scotland'

16. Houlder, C.H., 'The petrological identification of stone implements from Wales'

17. Francis, E.L., Francis, P.J., and Preston, J., 'The petrological identification of stone implements from Ireland'

All the authors have suffered equally from the volume's long period of gestation. The papers are inevitably of uneven quality. The nadir is hit by Houlder's almost exclusive concern with typological definitions which are not only inherently barren but reflect unfamiliarlity with the literature of the last twenty years.

The limitations of some other papers are those of the data, not of the authors, and fill the valuable function of highlighting work which needs to be done. Clough's and Cummins' terse and depressing account of the evidence from London and Middlesex reveals the capital as a petrological black hole, a situation which should surely not persist, especially as the richness and significance of prehistoric occupation along the lower Thames becomes more apparent with every passing year. Francis, Francis and Preston emphasise the need for further fieldwork and petrological investigation in Ireland, a point brought forcefully home by the list of Irish identifications, in which Group IX (Tievebulliagh and Rathlin Island Porcellanite), which forms 57% of all the axes examined, is the only grouped rock to figure in any quantity.

Many have particular strengths or points of interest. Cummins and Moore and Woodcock, Kelly and Woolley score highly by prefacing their regional papers with clear and helpful topographical introductions. Similar provision would have smoothed the paths of readers through other territories unfamiliar to them. Phillips, Cummins, and Keen perform the tour de force of defining petrological Group XXVI (north-east Yorkshire carbonate mudstone) and exposing it as the material of a suite of nineteenth-century fakes in the space of three pages. But how does their concluding section get away with so interpretation-loaded a term as 'rubbish pits' or so quaintly old-fashioned an expression as 'overhanging rim urn' ?

Newly-published associated finds confirm the chronological framework set out by Smith in 1979, except for a fragment of Group I axe from an Earlier Neolithic context on Hambledon Hill, which suggests that the long-distance dispersal of the group began earlier than was previously thought (Davis, Howard and Smith). It should be pointed out that a fragmentary chalk ?macehead (N217) from Redgate Hill, Hunstanton, Norfolk, comes from the top fill, not of a pit containing Grooved Ware (Green), but of a post-hole of a structure of so far uncertain date.

Themes which recur through the volume might profitably have been summarised in a concluding chapter. Isobel Smith's inexhaustible fund of knowledge and unparalleled gift for synthesis would have made her an ideal author. In the absence of such a contribution, a few salient points may be singled out:

A. The numerical paramountcy, now that many more identifications are available, of Group VI (Great Langdale and Scaffell tuff), which forms 39.5% of identified grouped implements (Clough).

B. The significance of implements of (so far) ungrouped rocks for understanding the overall nature and extent of the distribution of material from major source areas such as the Lake District and Cornwall (Clough; Davis, Howard and Smith; Green; Fell and Davis).

Reiteration of the importance of Carn Brea, even of enclosures farther east, in the distribution of Cornish products by Davis, Howard and Smith makes one wonder whether the Cumbrian stone circles and the multifarious communal monuments of the Yorkshire Wolds did not figure equally significantly in the distribution of Group VI products.

C. An inverse relation between the frequency of apparently imported implements in a region and the local supply of suitable stone, seen in the low proportion of foreign implements in Cumbria, where only four implements (1% of the total sectioned) can definitely be shown to be imports (Fell and Davis), and in Fenton's suggestion of the very rare long-distance transport of Scottish battle-axes and axe-hammers, attributed to the widespread availability of suitable rock types.

D. An acknowledgement that the distribution and use of stone implements might be more comprehensible if viewed together with that of flint implements (Woodcock, Kelly and Woolley; Green; Shotton).

The possibility is ignored by most of the authors, perhaps because of the overwhelming bulk of the data which might be unleashed upon them if they acknowledged it.

E. A fuller realisation that petrologically identical specimens may come from different, sometimes distant, sources (Fell and Davis; Fenton).

F. An increasingly realistic and balanced view of the manner and scale of the use of glacial erratics as raw material for stone implements (passim)

Casual working of local erratics is widely acknowledged, and sometimes evidenced by implements which retain part of the rounded, striated surface of the original pebble. Cummins and Harding estimate that 30% of the stone axes and many of the other implements sectioned from Durham and Northumberland may have been made from locally available erratics. Specific information has come from problem-oriented fieldwork and from replication. Phillips, Cummins and Keen establish that boulders attributable to Group XVIII (Whin Sill dolerite) are present among the North Sea Drift erratics of the Yorkshire coast, and that their frequency in relation to ungrouped dolerites and gabbros is close to the local frequency of Group XVIII implements in relation to others of these rocks. The coincidence of the distribution of Group XVIII implements with the extent of the North Sea Drift is noted by them and other authors. Fenton shows that erratic pebbles are preferable to freshly-quarried material for the manufacture of shaft-hole implements by pecking, because they are likely to be sound and tough and because selection of a pebble of appropriate size and shape greatly reduces the amount of work necessary to produce an implement.

The same authors are at pains to point out that these considerations do not apply equally to all rocks. Fenton makes an important distinction between relatively abundant, coarse-grained rocks suited to pecking (often used for shaft-hole implements) and scarce finer-grained rocks suited to flaking (often used for axes). It is the latter which have distributions unattributable to glacial transport, seen most clearly in implements from Cornish, Welsh and Irish sources in the north of England (Clough; Phillips, Cummins and Keen). It is these same rocks which were sometimes quarried on a substantial scale (Fell and Davis), and which are concentrated in parts of southern England where the corresponding erratics do not occur, such as the south-eastern edge of the Fenland Basin.

To these the writer would add a final topic, largely avoided in the volume: a consideration of the extra-functional significance of at least some stone implements. Axes of materials so soft that they could never have been used are mentioned by Woodcock, Kelly and Woolley. Miniature battle-axes are illustrated by Fenton. Contexts of deposition recorded by these and other authors include causewayed enclosures, henges, burials, and hoards. Many of the concentrations of stone implements shown on the distribution maps focus on major complexes of monuments, as in the Arbor Low and Rudston areas, and, even when they do not, as on the lower Thames or the south-eastern edge of the Fens, form part of larger concentrations of elaborately worked artefacts in other materials. On the evidence of the volume itself, not to mention the path which British prehistory has taken over the last decade, these objects should surely be seen as more than tools and weapons.

Sylvia Chappell's Stone Axe Morphology and Distribution in Neolithic Britain acknowledges non-functional considerations, but asserts them by uncritical recourse to ethnographic parallel rather than demonstrates them by analysis of the data. Specific contexts of deposition, which are summarised for each group, should serve to clarify the appropriateness of the analogy, but are presented uninformatively. Axes from communal monuments, burials, hoards and river finds, especially from the Thames, are listed baldly, with little attempt at interpretation; while settlement contexts are not quite what they seem. The text makes it clear (e.g. pp. 274-5) that many axes included in this category are stray finds from densely settled areas.

At 5p per page rather than the 12p of Stone Axe Studies 2 the work might appear to offer better value for money. It does not. Much of its bulk is due to the fact that the text, which occupies the first volume, is printed in double line spacing, which greatly increases the reader's burden, financial and physical.

It appears to be an unmodified version of a Ph.D. thesis submitted to the University of Michigan in 1986. It is therefore based on fewer petrological identifications than those assembled in Stone Axe Studies 2, and the distributions studied necessarily stop short at the northern borders of Yorkshire and Lancashire. This does not radically affect the author's conclusions for most of the groups studied, with the important exceptions of Cumbrian Groups VI and XV. It is based on data gathered in Britain and analysed and written up in the United States, with the unsurprising but regrettable consequence that the framework in which the analysis is set consists of a sketchy and out-of-date outline of contemporary prehistory. It is surprising to find that British society was primarily egalitarian throughout the Neolithic (p.104). Grime's Graves is assumed to have been an abundant source of axes (p.319), when the work of the last decade, especially by Saville, has shown that axes are unlikely to have been a major product of the site. There is no consideration of the possibility of plural or secondary sources for rocks of some groups.

The most lamentable consequence of long-range study of such a large and dispersed body of material is that metrical data were often obtained not from first-hand recording of the axes themselves but from drawings on petrology cards and from

published illustrations. Anyone who has compared either with the original objects would be loath to bank on their universal accuracy.

The method adopted is (1) to predict axe size variation and distribution in different social and economic circumstances, on the basis of the ethnographic record, the author's overview of British prehistory, and previous studies of ancient stone axe distribution; (2) to analyse size and shape variation in relation to source location for each petrological group, employing scatter diagrams, counts of the frequency of different dimension ranges, and other means including, for the more numerous groups, principal components analysis and cluster analysis, and (3) to interpret the results, evaluating the predictions against them.

Groups are ordered by region, then examined one at a time. The structure offers countless opportunities for chatty repetition, few of which are missed. One reads that exceptionally large axes are likely to have been non-utilitarian in respect of groups I (pp. 176,181), VI (pp. 265, 267), VIII (p. 218), XVI (p.146), XX (p. 315), and XXIII (p. 212) and stone axes in general (p. 337-8). Variations in intensity of prehistoric activity and of recent collecting are almost equally often invoked to explain away aspects of the data which do not conform to favoured models. Description of statistical analyses would have benefitted from editing. Information clearly readable from tables, plots and diagrams is repeated relentlessly in the text, with no exception made even for variables subsequently declared redundant (pp. 268-9), or for groups for which the sample size is so small, as in the case of eleven complete examples of group XXIII, as to place a question mark over the value of such exhaustive analysis. One has the impression that, as long as the right statistical package is employed, there is felt to be little need for critical thought.

The approach works best for the the large groups. It is argued convincingly that the nature of the fall-off in size with distance from their presumed Cornish source of Group I axes is more compatible with multi-directional distribution by coastal and riverine transport involving groups in a number of coastal locations, than with the bulk transport to the Thames estuary previously suggested by Cummins. Similarly, metrical and distributional data for group VI axes are interpreted as reflecting group-to-group exchange, with particularly large axes rare in peripheral areas, rather than bulk transport to Humberside or any other secondary centre of distribution.

But these are the main conclusions. The author's application of the multiple sources gravity model to groups I and VI, published in the Proceedings of the Prehistoric Society for 1986, does not form part of the volume. Overall, the volume retains the sterility of the vacuum in which it was written, scarcely marked by human considerations as distinct from statistical ones. It has lessons for the future: the same resources might have been better spent doing less more throughly. Recent research in the Group VI source area might, for example, have been complemented by first-hand study of its dispersed products and accurate documentation of the contexts in which they have occurred.

Frances Healy, May 1989