This volume is the outcome of the conference Lithic Studies in the Year 2000, which was hosted by the Lithic Studies Society in the National Museum and Gallery, Cardiff, in September 2000. The purpose of the conference was partly to celebrate the Society’s 21st birthday, and partly to look at new promising work from the field of lithic research and to promote the exchange of ideas between researchers whose paths might not otherwise have crossed.

At the conference, the many papers were distributed across five sessions, namely: behaviour and cognition in the Lower and Middle Palaeolithic; raw material studies; Bronze Age and later lithics; lithics in transition; and use-wear and residues. In the present volume, these themes were compressed into the topics: behaviour and cognition in the Lower and Middle Palaeolithic; rocks, residues and use-wear; and after hunter-gatherers, with the addition of a few other papers by authors who were unable to attend the event. In the book’s preface, the editors express their hope that ‘it will provide both a useful snapshot of the current diversity of lithic studies and will signpost new directions for lithic research’.

The proceedings are richly illustrated, with many location maps, excavation plans and profiles, diagrams, tables, artefact drawings, and photos of artefacts and sites. In general, these elements are of high quality and make reading the volume a pleasure, but a small number of diagrams and maps have lost some resolution and appear slightly blurred (e.g. Figs 2.2, 9.1, and 14.1). To allow comparison, a number of tables ought to have included not only simple counts but also percentages. In Table 2.4, for example, the artefact composition of the three sectors of the Middle Palaeolithic site Hermies le Tio Marché is presented, but, as the reader is only given counts, it is very difficult to see whether the assemblages of these sectors differ in relative terms. However, those are only minor ‘blemishes’ on the volume, and Lithics in Action is a well-produced book.

The division of the proceedings into three sections seems to be an acceptable compression of the original five topics, but with the first and last of the book’s sections being defined partly in chronological terms (Lower and Middle Palaeolithic / after hunter-gatherers), the first thought of most readers will probably be: ‘where did the Mesolithic people go”? The organisers may have felt that research into Palaeolithic and post-Mesolithic matters were more urgent than dealing with entirely Mesolithic topics, but the complete lack of Mesolithic papers appears slightly unbalanced. The present reviewer is a firm believer in the construction of detailed chronological frameworks as necessary tools in the interpretation of prehistory, and the British Mesolithic chronology (or lack of?) is an example of one Mesolithic topic in need of ‘stimulation’ (though the topic seems to be ‘alive and kicking”; e.g. Reynier 1998, 2000).

The most homogeneous of the three sections is the first one, dealing with Lower and Middle Palaeolithic behaviour and cognition. This part of the volume was edited by Francis Wenban-Smith, who presents a detailed overview of past and present Lower/Middle Palaeolithic research, and, within the sphere of Early Palaeolithic lithic research, he defines areas in need of future attention (Chapter 1). The papers of this section give the impression of belonging to a coherent research field, characterized by a strong consensus on direction and methodology,
and, in most cases, interesting conclusions are reached. Most of the contributions are strongly founded on site case studies, or on place (Vallin & Masson, Chapter 2; Hallos, Chapter 3; Pope, Chapter 4), whereas Wenban-Smith is more concerned with the wider archaic landscape (Chapter 5), and Ashton puts forward a review of the role of refitting in the research of the British Lower Palaeolithic (Chapter 6).

Methodologically, this section appears up-to-date, with research focusing on the preferential application of refitting and chaîne opératoire approaches. These analyses are partly supported by results from attribute analysis and experimental work. Combined, these methods provide useful results on site activities, as well as on the way the individual early hominin sites formed part of the prehistoric landscape. An important point made by several authors is the fact that the lithic reduction process was not spatially static, in the sense that reduction sequences linked to one original nodule could be found across a given site (e.g. Vallin & Masson, Chapter 2), and in many cases refitting suggested that parts of specific reduction sequences occurred outside the excavated site (e.g. Hallos, Chapter 3; Pope, Chapter 4).

The fact that much flint was transported onto and off the analysed sites implies early hominin curation and links this section to the on-going debate of expediency/curation and cognition in the Lower and Middle Palaeolithic, suggesting that these early people may have been less primitive than they are frequently thought to have been (e.g. Hallos, Chapter 3; Pope, Chapter 4). Pope talks about a ‘spatially extended chaîne opératoire’, and attempts to provide a measure of the net import/export of bifaces by comparing on-site débitage per biface with experimentally obtained débitage: biface ratios. Though interesting and apparently useful, this approach should be used with caution, as these ratios may have varied over time, with the application of different reduction methods, knapping skills, and raw materials (this comment also covers Wenban-Smith’s experimentally based suggestion of an average production of 50–55 flakes per handaxe in Chapter 5).

The reviewer’s immediate reaction to the wide-spread use of refitting was concern, as he has applied and discussed this approach extensively (e.g. Ballin 2000). Though refitting mostly delivers interesting results, it is a time-consuming and thereby expensive method, which ought to be applied sparingly in order to answer specific, well-defined questions. However, the volume’s refitters are aware of the snares of this popular method, and reference is made to Mithen’s (1998: 97) critique of refitting as being, to some degree, influenced by a ‘gee-whiz’ factor (Ashton, Chapter 6). Quoting Roe (1980), Pope (Chapter 4) points out that refitted knapping floors may present an insight into ‘precise moments in remote time’ but that these snap-shots frequently fail ‘...to translate into the detailed documentation of hominin behaviour required to address wider issues of technological variation in the Lower Palaeolithic’.

Intimate ‘snap-shot archaeology’ may be popular with the lay audience (one example being television’s attempts at reconstruction of prehistoric and historic individuals’ faces), but in many/most cases, refitting-based reconstructions of prehistoric moments adds little knowledge on the subject of past hominin, or human, behaviour in general terms. However, the refitting projects of this volume’s Section 1 deal with much broader questions, and they provide exciting results on cognition and behaviour, as well as on place and landscape in the early hominin world.

Wenban-Smith’s (Chapter 5) claim that palimpsest sites commonly reveal more about general hominin behaviour than single-occupation sites, must be an example of ‘how to make a virtue of necessity’. His thought is that this form of accumulation tends to exaggerate the patterning
of behaviour across the landscape, bringing it more into focus, but as many Early Palaeolithic palimpsest sites include material deposited over tens of millennia, possibly by groups with very different approaches to landscape and resource management, the resultant picture surely must be less credible than one based on the analysis of single-occupation sites.

The following section, rocks, residue and use-wear, is edited and introduced by Elizabeth A. Walker. Where the first part of the volume was defined chronologically (the Lower and Middle Palaeolithic) and in terms of research focus (behaviour and cognition), and the proceedings’ third part entirely chronologically (post-Mesolithic industries), the second section is concerned with methodology: the identification and provenancing of lithic and stone raw materials (Chapters 9–12, 14) and the identification of use-wear and residues (Chapters 15–19). In slightly exaggerated terms, the former links the individual site and assemblage to local, regional, or even remote landscapes, whereas the latter is more concerned with on-site activities, thus complementing raw material analyses. Mandal et al. (Chapter 13) present the results of experiments into axehead production, and they estimate the time needed to produce usable stone axes, taking the varying properties of different raw materials into consideration, as well as the skills of the artisan.

The first two papers of this section (Harding et al., Chapter 9; Diethelm, Chapter 10) contribute to an on-going discussion of whether provenancing of flint is a fruitful avenue of research (e.g. Luedke 1992; Ekelund Nielsen 2000). The main approaches of this research field are macroscopical analysis (for example, colour and patterning), chemical trace element analysis, and microfossil analysis, with both Harding et al. and Diethelm giving preference to the latter approach. Harding et al. base their research on the identification of diagnostic organic-walled microplankton (OWM), whereas Diethelm attempts to identify parent rock formations through the presence of foraminifera. Only provenancing based on the identification of OWM proved acceptably successful, and further investigation into this approach should be encouraged.

Ixer et al. (Chapter 12) compare two main approaches to the classification and provenancing of stone, one intrusive (‘total petrography’, largely based on thin-section analysis) and one non-intrusive (geochemistry), and conclude that the two methods are almost equally effective. However, thin-section analysis is a more reliable and precise approach, and geochemical analysis does require fairly fresh and flat surfaces to analyse. The authors suggest that the limitations of geochemical analysis may be mitigated by its being faster and non-destructive.

While Chapters 9, 10 and 12 are concerned with the scientific background to raw material classification and provenancing, Aldhouse-Green et al. (Chapter 11) and Bond (Chapter 14) represent case studies based on the application of such approaches. Yet, while Aldhouse-Green et al. discuss the internal chronology of one site (Pontnewydd Cave in Wales), Bond discusses the likely interconnectedness of sites in a landscape (the Mendip Hills). Both are interesting papers, but Bond’s discussion of a potential Mendip Hill exchange network is weakened somewhat by the fact that his surface scatters include material from most of the Stone and Bronze Age periods: most likely, exchange networks changed over time, and the network systems of mobile hunter-gatherers and sedentary people probably differed. The fact that the many raw materials from the Pontnewydd Cave seems to have been preferred for different tool types and different types of primary production (core types) is intriguing and indicates a high level of consideration and planning from the cave’s Neanderthal knappers.
In Chapters 15–19 use-wear/residue analysis is either discussed or applied, or both. In several cases, the methodological discussion is combined with, and strengthened by, experimental work. Donahue & Burroni (Chapter 15) investigate the potential effect of post-depositional processes on the formation of surface modifications, and they present a useful list of ‘microscopic surface modifications unrelated to use’. Rots & Vermeersch (Chapter 18) and Pawlik (Chapter 19) both deal with the effects of hafting on lithic tools. The former authors discuss hafting traces, and their extensive experimental programme shows that hafting and use-wear traces do differ, and that the formation of hafting traces are affected by the material worked, as well as by the specific use action. Their work forms a natural continuation of Keeley’s (1982) original paper on ‘hafting and retooling’. Pawlik’s Chapter 19 is mainly concerned with the potential use of birch tar as hafting glue, and his analysis of experimentally produced birch tar indicates that certain archaeological residues may be birch tar, and that the production method of this material in Mesolithic times probably differed from the known medieval method of tar production.

Pawlik’s (Chapter 16) discussion of a possible Early Bronze Age ‘pocket lighter’ is interesting but very brief, and he ought to have included a reference to Stapert & Johansen’s (1999) fine paper on Stone Age fire-making by the application of flint and pyrite. Skrøver’s paper (Chapter 17) is an equally short presentation of the results of experiments carried out at the Historical Archaeological Experimental Centre in Lejre, Denmark. He discusses the difference between use-wear from cutting roasted meat and fresh hide and concludes, following a blind test, that it is not yet possible to distinguish unequivocally between the two forms of wear.

The final section, after hunter-gatherers, was edited by Frances Healy, and, though this section is the most heterogeneous of the three, she manages to define a number of important developments characterizing post-Mesolithic industries across Europe and the Near East. The most important general trends are: a move from sophisticated towards expedient lithic industries in early metal cultures; the transfer of extra-functional significance (for example, stylistic elements) from lithic artefacts to other materials; and a move away from deposition of lithics in burials.

Nielsen (Chapter 22) and Domańska (Chapter 23) mainly discuss the chronological frameworks of their respective homelands, Alpine Switzerland and North European Poland, at the Mesolithic/Neolithic transition. Both are fine papers in their own right, but with limited audiences. As they focus almost exclusively on the chronology of their local material cultures, their potential readers are restricted to those with a special interest in Swiss and Polish prehistory.

The broadest of the two works is Domańska’s paper, touching upon the development of the Funnelbeaker Culture (TRB) sensu largo, but she makes the same mistake as so many other scholars who have discussed this entity. In her comparison with the TRB of Southern Scandinavia, she relies on the summary presentations, written in English and German, and the

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17 In Ballin (2002: 25) this process was described in the following terms: Phase 1 — tool production is totally dominated by lithic raw materials (Late Neolithic); Phase 2 — introduction and increasing use of metals — competition between lithic and metal production leads flintknappers to replicate metal products, and within the sphere of prestige objects a remarkable increase in knapping skills is observed (Early Bronze Age); Phase 3 — metal production reaches an output level, and degree of organisation, which makes it possible to substitute lithic raw materials in the production of prestige objects — plain utilitarian tool types are still manufactured in lithic materials (Later Bronze Age and ?Early Iron Age); and Phase 4 — lithic raw materials are phased out completely (?mid-Early Iron Age).
more detailed Danish and Swedish papers are ignored (e.g. Ebbesen & Mahler 1979; Larsson 1984; Madsen & Petersen 1983; as well as the general academic production of C.J. Becker, Th. Mathiassen, and T. Madsen). Like other analysts (e.g. Stafford (1999) in his otherwise fine paper on the transition ‘From Forager to Farmer in Flint’), she presents the three local groups Volling, Oxie and Svalekliint as equal entities, in terms of lithic technology, whereas they actually represent three relatively distinct lithic industries. This creates a problem to the interpretation of the transition of the Ertebolle Culture into the TRB Culture, as the local TRB industry most similar to the Ertebolle flint and pottery tradition is the Oxie industry (e.g. Nielsen 1984: 112), whereas Domańska presents the Volling group as the oldest of the three.

From a British point of view, Domańska’s paper is interesting, as it describes the development of lithic industries in a completely landlocked environment, where typo-technological and socio-economical elements are borrowed from neighbouring cultures on all sides, whereas in Britain, through most of prehistory, foreign influence was mainly felt in the Channel region.

In Migal’s paper (Chapter 24), the social background to the development of Poland’s Bronze and Early Iron Age industries is discussed (see Note 1, this paper). First, as a result of growing competition with incoming metal products, the local communities either produced or imported impressive prestige products in flint (Phase 2), whereas, later, the lithic technology deteriorated and was abandoned. Though Migal has an informative table at the end of his paper, summarising the changes in flint-working during the Polish Bronze and Early Iron Age periods, his and Domańska’s papers would have benefited from initial chronological tables presenting the many local and regional cultures/industries.

Larsson (Chapter 22) and Högb erg (Chapter 25) are both concerned with Southern Scandinavian finds groups, and the social contexts of these finds. Larsson discusses the intentional destruction of mainly flint axeheads by fire in the Southern Scandinavian Middle Neolithic. The scale of this destruction, and the combination of burnt flint with pits, imported artefacts, and burnt human bones clearly indicate ritual behaviour, and Larsson’s comparison of this tradition with the earlier Neolithic tradition of depositing objects in wetlands, rather than burning them, is interesting. His mention of a tendency to scatter white-burnt flint across the floors of megaliths is useful, as it appears to mirror local British traditions of scattering quartz pebbles or burnt quartz across floors of chambered tombs, or the surfaces of the covering mounds (Lebour 1914). Somehow, the colour white was significant to prehistoric people, and particularly so in connection with burial rituals (rites of passage?) (Darvill 2002).

Högberg’s paper deals with the parallel production in the Southern Scandinavian later Bronze Age of large flint blade knives and simple expedient flake tools. However, the reviewer feels that his presentation of these artefact groups as representing two different technological traditions is somewhat exaggerated. The dual production of curated and expedient tool forms was common in most prehistoric industries.

The possible use of flint in the British Iron Age is discussed by Humphrey (Chapter 26), but the author does not add new information to that put forward previously (Young & Humphrey 1999), and the attributes presented as characteristic of post-Bronze Age flintworking also fit most post-Early Bronze Age industries (e.g. Saville 1981; Herne 1991; Ballin 2002). The difference between Middle/Late Bronze Age industries and Early Iron Age industries remains undefined.
The volume’s final papers by Moloney (Chapter 27) and Phillipson (Chapter 28) consider extra-European industries. Moloney’s paper is a study of lithics in a Jordanian Early Bronze Age environment, and not least their procurement, exchange, and possible application in the production of copper. Phillipson’s discussion of an Ethiopian microlithic industry dated to the time of the Aksumite civilization (1st century BC–7th century AD) is problematic, as the lithics claimed to have been found in ‘indisputably’ Aksumite contexts appear, mainly, to represent surface scatters, thus leaving several loose ends: Phillipson does not consider whether the entire lithic material actually pre-dates the Aksumite Culture, or whether the concentrations of different scraper types represent separate prehistoric events, rather than (as the excavator suggests) specialized contemporary activity areas? More work is clearly needed to elucidate this potential Aksumite industry.

Taken as a whole, Lithics in Action is a fine volume, providing (as the editors hoped it would) a ‘useful snapshot of the current diversity of lithic studies’. Different prehistoric periods and environments obviously present different challenges and, as a consequence, the lithics analyst must select his or her approach carefully. One approach does not fit all. In some geographical areas, chronological questions (including typo-technology) are at the forefront, whereas in other areas these have been dealt with in a satisfactory manner, and socio-economical or behavioural-cognitive questions are now being focused upon. The different questions require different approaches and methods, and Lithics in Action represents a cornucopia of options, such as refitting, attribute analysis, experimental archaeology, raw material analysis, use-wear analysis, and combinations of these approaches.

The editors’ second hope, that the volume ‘will signpost new directions for lithic research’, has probably been partially fulfilled, in the sense that some analysts, after having digested the various papers, may feel inspired to try out new approaches, but to many researchers the old approaches may still be the most relevant ones: which approach or method is the most appropriate one is always decided by the specific questions facing the individual analysts. Conference proceedings have a general tendency to be variable and, in terms of geographical and chronological coverage, the present volume is most certainly mixed. However, the focus of Lithics in Action is clearly lithic methodology and analytical approaches, and, as such, the reviewer feels happy to recommend this book.

**BIBLIOGRAPHY**


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