

# CHAPTER 10

## CONCLUSIONS

### 1. INTRODUCTION

The focus of this project has been the UK's archaeological secondary context resource, with specific reference to the Lower and Middle Palaeolithic periods (*c.* 500–40,000 years BP). The archaeological value and potential of this resource has been demonstrated through a series of investigations exploring:

- The spatio-temporal structure of the resource, emphasising the chronology of the secondary contexts (fluvial sedimentary deposits) and the derivation of the archaeology (stone tool assemblages).
- The range and types of archaeological data which can be extracted from secondary context assemblages.
- The relationships between archaeological secondary contexts and extant analytical and interpretive frameworks.
- The management of the secondary context resource.

### 2. SUMMARY

The key points raised by this project in the preceding report are summarised below:

#### *2.1 The temporal structure of fluvial sedimentary deposits (Chapters 2 & 3)*

1. Fluvial activity during the Middle and Late Pleistocene (787–11,000 years BP) is associated with periods of climatic change.
2. These periods of climatic change operate both at high magnitudes and low frequencies (the 100,000 year glacial/interglacial (Milankovitch) cycles) and at low magnitudes and higher frequencies (sub-Milankovitch climatic variations, occurring over centennial or millennial timescales).
3. Fluvial studies from the last glacial/interglacial cycle (127–11,000 years BP) and the Holocene (11,000–present) indicate that:
  - a. phases of fluvial activity occurring in response to climatic change are relatively rapid, typically lasting hundreds rather than thousands of years.
  - b. all rivers typically respond to the 100,000 year Milankovitch cycle climatic events, while fluvial response to the sub-Milankovitch climatic variations is less universal.
4. Fluvial activity is not *continuous* during these periods (e.g. sedimentation is likely to have occurred only in response to spring floods during an annual cycle), but current geochronological tools do not permit such high resolution dating.
5. There is only partial preservation of fluvial sedimentary features from the Middle and Late Pleistocene periods. Typically, the larger-scale features associated with the Milankovitch cycles are favourably preserved, while the small-scale features associated with the sub-Milankovitch events are vulnerable to subsequent erosion.
6. Sedimentary units can be dated to individual marine isotope stages and it is *predicted* that they represent short periods of time (probably hundreds of years). However, current geochronological tools do not permit the dating of sedimentary units to specific episodes of climatic change.

#### *2.2 The temporal structure of archaeological assemblages occurring within fluvial sedimentary deposits (Chapter 5 & 7)*

1. The artefacts are derived and have therefore been removed from their original place of discard by processes of soil erosion, solifluction and flooding. The artefacts were incorporated into fluvial

sedimentary deposits by stream flow. These processes have two implications:

- a. the artefacts are older than the formation of the sedimentary deposit. The sediments therefore only provide a *terminus ante quem* age. Assessing the relative magnitude of the age discrepancy between the archaeology and the fluvial sediments was therefore a major focus of this research (see also points 2–5 in this section).
  - b. the findspot locations associated with secondary context assemblages cannot be regarded as ‘sites’ in the same way as *in situ* contexts from the Palaeolithic (e.g. Boxgrove) and later archaeological periods.
2. The frequency of sub-Milankovitch climatic variations (interstadial events occurred every 3–4,000 years over the last 80,000 years) indicates that artefacts discarded upon floodplain surfaces would have been regularly exposed to significant fluvial activity. While preservation of the fluvial sediments associated with high frequency climatic events is variable (see above), their widespread occurrence within European Late Glacial and Holocene river systems indicates that artefacts are unlikely to have lain upon *unmodified* floodplains for tens and hundreds of thousands of years.
  3. Once artefacts have been incorporated into fluvial sedimentary deposits they are potentially vulnerable to subsequent erosion of those deposits. This can result in the artefacts being re-worked into younger deposits. The age discrepancy between the younger and older deposits can range between hundreds of years (reflecting localised erosion in response to sub-Milankovitch climatic events) and hundreds of thousands of years (reflecting river downcutting in response to Milankovitch cycles).
  4. A model is therefore presented for assessing the degree of temporal re-working undergone by artefact assemblages. The model emphasises:
    - a. the fluvial morphology and its implications for the preservation/erosion of sedimentary (river terrace) deposits.
    - b. the local and regional geological bedrock controls and their implications for preservation/erosion of the deposits.
    - c. the stratigraphic position of the artefact assemblage, its relationship to fluvial activity across a Milankovitch-scale glacial/interglacial cycle, and its probable chronology of re-working.
    - d. the physical condition of the artefacts (Section 2.3 below).
  5. The model provides a *relative* measure of the degree of re-working undergone, and the importance of sedimentary evidence from the field is emphasised for the evaluation of the model.

### 2.3 The spatial structure of archaeological artefact assemblages (Chapters 4, 5 & 7)

1. The physical condition of all the stone tool assemblages examined from archaeological secondary contexts indicates that they have undergone degrees of fluvial transport.
2. Experimental flume research has documented distinctive patterns of artefact damage, sustained during fluvial transport. Damage was assessed in terms of the *état physique* of the artefacts, incorporating arête ridge widths, edge micro-flaking and gross factors of artefact morphology. The distinctive patterns indicate different modes of bed-load transport and enable the differentiation of damage sustained during phases of movement and damage sustained during static periods.
3. Modelled transport distances were based upon comparisons between the damage sustained by experimental artefacts over known transportation distances and that displayed by artefacts from archaeological secondary contexts.
4. The modelling allowed the source areas of derived artefact assemblages to be mapped and inter-assemblage comparisons to be undertaken.

### 2.4 The range and types of archaeological data in secondary context assemblages (Chapters 4, 6 & 7)

1. The vast majority of data consists of fluvial sedimentary deposits and stone tools.
2. Although palaeoenvironmental material occurs within archaeological secondary contexts, the contrasting spatio-temporal scales of the data do not permit their *direct* equation with the derived

artefact assemblages. When dealing with derived, secondary contexts, it cannot be assumed that the artefacts, fauna and flora were ever associated in time and/or space prior to their deposition within the same sedimentary deposit. Reconstructed palaeoenvironments are therefore only specific examples of some of the range of habitats that existed prior to and during fluvial depositional events, but they cannot be explicitly populated with either hominids or artefacts.

3. The spatio-temporal models of the structure of the archaeological secondary contexts indicated nine distinct analytical scales for the interpretation of the artefact data. Chronological scales ranged from sub-MI stages (100's and 1,000's of years) to MIS cycles (100,000's years). Spatial scales ranged from local (10's and 100's of metres) to regional, river system basins (1,000's of metres).
4. Research questions and techniques vary between the spatio-temporal scales (e.g. the analysis of technological trends at local, sub-MI stage scales, and demographic modelling at regional, MIS-cycle scales). Case studies were presented for the secondary context assemblage at Broom (Chapter 4) and the Axe and Test valley basins (Chapter 9).

### *2.5 Relationships between archaeological secondary contexts and extant analytical and interpretive frameworks (Chapter 9)*

1. Archaeological research operates at a variety of data scales and resolutions. The project therefore sought to map the secondary context archaeological resource against appropriately scaled research questions.
2. It was clear that there are specific research questions that cannot be answered from archaeological secondary contexts (e.g. on-site analysis of spatial patterning in artefact distributions and subsistence practices).
3. It was also clear that there are specific research questions that are best addressed through archaeological secondary contexts (e.g. demographic patterns over MIS cycles and regional variations in artefact densities).
4. In order to fully investigate hominid behaviour, it is necessary to integrate primary and secondary context data. The frameworks proposed here have therefore highlighted the scope of secondary context investigations and demonstrated their incorporation within existing research frameworks more traditionally associated with primary context data-sets.

### *2.6 With respect to the management of the secondary context resource (Chapter 8)*

1. The aggregates industry has facilitated the recording of the majority of UK Palaeolithic data, due to the deeply buried nature of the resource.
2. Therefore, archaeological watching briefs are the principal available mechanism for the monitoring of archaeological secondary contexts and the recording of data.
3. Current archaeological watching brief practice offers a range of contingency measures should *in situ* archaeology be discovered and suggests that monitoring is primarily concerned with such discoveries. This practice is unhelpful as it both downplays the value of the secondary context resource and presents an unfavourable image of archaeological intervention to the aggregates industry.
4. The spatio-temporal models have highlighted the importance of geochronological and sedimentary data from archaeological secondary contexts. It is therefore proposed that archaeological watching briefs need to:
  - a. Explicitly state that Palaeolithic archaeological data from secondary contexts is not restricted to lithic artefacts. This principle should be explicit within both project design and practice.
  - b. Develop cost-effective strategies for the systematic geochronological sampling of fluvial sedimentary sequences, utilising recent developments in OSL and amino-acid techniques. Developing securely dated geochronological sequences is important both for regions with and without a rich artefact heritage.
  - c. Develop cost-effective strategies for the systematic lithostratigraphic recording of fluvial

- sedimentary sequences. These recording processes can be streamlined using new technologies (e.g. digital data-capture devices).
- d. In regions with rich artefact assemblages, reduce the focus upon the collection of lithic artefacts.
  - e. However, in regions without demonstrated Palaeolithic occupation, sampling for lithic artefacts should be afforded a higher priority.
5. It is stressed that these proposals for watching brief practice would need to be developed in conjunction with the aggregates industry, and that the archaeological community needs to emphasise:
- a. That the primary goal of the watching brief process must still be preservation by record, given the destructive nature of the aggregates extraction process.
  - b. That the principle foci of this preservation by record are the secondary context data (sedimentary sequences, geochronological sampling, and artefact recovery from exposed sections).
  - c. That the secondary goal of the watching brief process must be the streamlining of on-site time and the minimising of disruption to industrial process.
  - d. That primary context, *in situ* discoveries are extremely rare and that the profitable recovery of valuable secondary context data can be rapid and cost-efficient.

### 3. FUTURE DIRECTIONS

The project has also highlighted a number of areas towards which future research should be profitably directed:

- The development of regional geochronological frameworks for fluvial sedimentary sequences.
- Refinement of geochronological techniques with respect to their application and resolution over Pleistocene timescales.
- Experimental research exploring artefact behaviour within fluvial systems and the formation of secondary context assemblages.
- Re-investigation of historic secondary context artefact assemblages, utilising current models, recording methodologies and techniques.

### 4. CONCLUSION

In conclusion, this investigation into the archaeological potential of secondary contexts has demonstrated that:

- Due to their extensive geographical and temporal coverage, archaeological secondary contexts from the British Palaeolithic are a unique resource.
- The taphonomic processes associated with the spatio-temporal structure of the resource can be successfully modelled using extant data and new techniques.
- Valuable data for the reconstruction of early human behaviour can be extracted from secondary context artefact assemblages, at a range of different spatio-temporal scales.
- The development of appropriate strategies for the continuing management and recording of the secondary context resource during aggregates extraction are therefore vital.
- The integration of the primary and secondary context resource is critical to gaining a fuller understanding of early human behaviour during the British Palaeolithic.

# REFERENCES

- Adamic, G. & Aitken, M.J. 1998. Dose-rate conversion factors: new data. *Ancient TL* 16: 37–50.
- Allen, L.G. & Gibbard P.L. 1993. Pleistocene evolution of the Solent River of southern England. *Quaternary Science Review* 12: 503–528.
- Anklin, M., Barnola, J.-M., Beer, J., Blunier, T., Chappellaz, J., Clausen, H.B., Dahl-Jensen, D., Dansgaard, W., Angelis, M. de., Delmas, R.J., Duval, P., Fratta, M., Fuchs, A., Fuhrer, K., Gundestrup, N., Hammer, C., Iversen, P., Johnsen, S., Jouzel, J., Kipfstuhl, J., Legrand, M., Lorius, C., Maggi, V., Miller, H., Moore, J.C., Oeschger, H., Orombelli, G., Peel, D.A., Raisbeck, G., Raynaud, D., Schott-Hvidberg, C., Schwander, J., Shoji, H., Souchez, R., Stauffer, B., Steffensen, J.P., Svejnar, M., Sveinbjornsdottir, A., Thorsteinsson, T. & Wolff, E.W. 1993. Climate instability during the last interglacial period recorded in the GRIP ice core. *Nature* 364: 203–207.
- Ashton, N., Dean, P. & McNabb, J. 1991. Flaked flakes: what, where, when and why? *Lithics: The Newsletter of the Lithic Studies Society* 12: 1–11.
- Ashton, N.M., Cook, J., Lewis, S.G. & Rose, J. (ed's). 1992. *High Lodge: Excavations by G. de G. Sieveking 1962–1968 and J. Cook 1988*. British Museum Press, London.
- Ashton, N., McNabb, J., Irving, B., Lewis, S. & Parfitt, S. 1994. Contemporaneity of Clactonian and Acheulian flint industries at Barnham, Suffolk. *Antiquity* 68: 585–589.
- Ashton, N.M., Lewis, S.G. & Parfitt, S.A. (ed's). 1998. *Excavations at the Lower Palaeolithic site at East Farm, Barnham, Suffolk 1989–94*. British Museum Occasional Paper No. 125. British Museum, London.
- Ashton, N., Lewis, S.G. & Parfitt, S.A. 2000a. East Farm, Barnham, Suffolk. In S.G. Lewis, C.A. Whiteman & R.C. Preece (ed's) *The Quaternary of Norfolk & Suffolk: Field Guide*. 165–175. Quaternary Research Association, London.
- Ashton, N., Lewis, S.G., Keen, D. & Parfitt, S.A. 2000b. Excavations at Elveden, Suffolk (TL 809804). In S.G. Lewis, C.A. Whiteman & R.C. Preece (ed's) *The Quaternary of Norfolk & Suffolk: Field Guide*. 165–175. Quaternary Research Association, London.
- Ashton, N. & Lewis, S. 2002. Deserted Britain: Declining Populations in the British Late Middle Pleistocene. *Antiquity* 76 (2002): 388–396.
- Bagnold, R.A. 1980. An empirical correlation of bedload transport rates in flumes and natural rivers. *Royal Society of London Proceedings A372*: 453–473.
- Bailey, G.N. 1980. Concepts of time in Quaternary prehistory. *Annual Review of Anthropology* 12: 165–192.
- Bailey, R.M. In press. The analysis of measurement-time dependent single aliquot equivalent dose estimates from quartz: implications for the identification of incompletely-bleached sediments. *Radiation Measurements*.
- Bates, M.R. & Wenban-Smith, F.F. In prep. *The Palaeolithic Archaeology of the Sussex/Hampshire Coastal Corridor*. English Heritage Project Report (Project No. 3279).
- Best, J. L. & Bristow, C.S. 1993. *Braided Rivers*. Geological Society Special Publications, Volume 75. Geological Society, London.
- Best, J., Bennett, S., Bridge, J. & Leeder, M. 1997. Turbulence Modulation and Particle Velocity over Flat Sand Beds at Low Transport Rates. *Journal of Hydraulic Engineering* 123(12): 1118–1129.
- Bibus, E. & Wesler, J. 1995. The middle Neckar as an example of fluvio-morphological processes during the Middle and Late Quaternary period. In J. Hagedorn (ed.) *Late Quaternary and present-day fluvial processes in Central Europe*: 15–26. Gebrüder Borntraeger, Berlin.
- Binford, L.R. 1980. Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45: 1–17.
- Binford, L.R. 1987. Searching for Camps and Missing the Evidence?: Another Look at the Lower Palaeolithic. In O. Soffer (ed.) *The Pleistocene Old World: Regional Perspectives*: 17–31. Plenum Press, New York.
- Binyon, F.M. 2002. *Modern methods on ancient axes: a study of the Broom bifaces*. Unpublished MA Dissertation, University of Southampton.
- Boëda, E., Geneste, J.-M. & Meignen, L. 1990. Identification de chaînes opératoires lithiques du Paléolithique ancien et moyen. *Paléo* 2: 43–80.
- Boggs, S. 1987. *Principles of Sedimentology and Stratigraphy*. Merrill, Columbus.
- Boismier, W.A., Schreve, D.C., White, M.J., Robertson, D.A., Stuart, A.J., Etienne, S., Andrews, J., Coope, G.R., Field, M.H., Green, F.M.L., Keen, D.H., Lewis, S.G., French, C., Rhodes, E., Schwenninger, J.-L., Tovey, K., Donahue, R.E., Richards, M.P. & O'Connor, S. 2003. A Middle Palaeolithic Site at Lynford Quarry, Mundford, Norfolk: Interim Statement. *Proceedings of the Prehistoric Society* 69: 315–324.
- Bowen, D.Q., Hughes, S., Sykes, G.A. & Miller, G.H. 1989. Land–sea correlations in the Pleistocene based on isoleucine epimerization in non-marine molluscs. *Nature* 340: 49–51.
- Brewer, P.A., Maas, G.S. & Macklin, M.G. 2000. A fifty year history of exposed riverine sediment dynamics on

- Welsh rivers. In J.A.A. Jones, K. Gilman, A. Jigorel & J. Griffin (ed's) *Water in the Celtic World: Managing Resources in the 21<sup>st</sup> Century*: 245–252. British Hydrological Society, Wallingford.
- Brewer, P.A., Macklin, M.G. & Jones, A. 2002. Channel change and bank erosion on the Afon Rheidol: the Felin Rhiwarthen and Lovesgrove meanders. In M.G. Macklin, P.A. Brewer & T.J. Coulthard (ed's) *River systems and environmental change in Wales: Field Guide*. 40–50. British Geomorphological Research Group, Aberystwyth.
- Bridgland, D.R. 1985. Uniclinal shifting: A speculative reappraisal based on terrace distribution in the London Basin. *Quaternary Newsletter* 47: 26–33.
- Bridgland, D.R. 1994. *Quaternary of the Thames*. Geological Conservation Review Series 7. Chapman and Hall, London.
- Bridgland, D.R. 1995. The Quaternary sequence of the eastern Thames basin: problems of correlation. In D.R. Bridgland, P. Allen & B.A. Haggart (ed's) *The Quaternary of the Lower Reaches of the Thames: Field Guide*: 35–52. Quaternary Research Association, Durham.
- Bridgland, D.R. 1996. Quaternary River Terrace Deposits as a Framework for the Lower Palaeolithic Record. In C.S. Gamble & A.J. Lawson (ed's) *The English Palaeolithic Reviewed*: 23–39. Wessex Archaeology Ltd., Salisbury.
- Bridgland, D.R. 1998. The Pleistocene history and early human occupation of the River Thames valley. In N. Ashton, F. Healy & Pettitt, P. (ed's) *Stone Age Archaeology: Essays in honour of John Wymer*: 29–37. Lithic Studies Society Occasional Paper 6. Oxbow Books, Oxford.
- Bridgland, D.R. 2000. River terrace systems in north-west Europe: an archive of environmental change, uplift and early human occupation. *Quaternary Science Review* 19: 1293–1303.
- Bridgland, D.R. 2001. The Pleistocene Evolution and Palaeolithic Occupation of the Solent River. In F.F. Wenban-Smith & R.T. Hosfield (ed's) *Palaeolithic Archaeology of the Solent River*: 15–25. Lithic Studies Society, London.
- Bridgland, D.R. & Harding, P.A. 1987. Palaeolithic sites in tributary valleys of the Solent River. In K.E. Barber (ed.) *Wessex and the Isle of Wight: Field Guide*: 45–58. Quaternary Research Association, Cambridge.
- Bridgland, D.R. & Harding, P.A. 1993. Preliminary Observations at the Kimbridge Farm Quarry, Dunbridge, Hampshire: Early Results of a Watching Brief. *Quaternary Newsletter* 69: 1–9.
- Bridgland, D.R., Allen, P. & Haggart, B.A. (ed's). 1995. *The Quaternary of the Lower Reaches of the Thames: Field Guide*. Quaternary Research Association, Durham.
- Bridgland, D.R. & Allen, P. 1996. A revised model for terrace formation and its significance for the lower Middle Pleistocene Thames terrace aggradations of north-east Essex, U.K. In C. Turner (ed.) *The Early Middle Pleistocene in Europe*: 121–134. Balkema, Rotterdam.
- Bridgland, D.R., Keen, D.H. & Maddy, D. 1989. The Avon terraces: Crophorne, Ailstone and Eckington. In D.H. Keen (ed.) *West Midlands: Field Guide*: 51–67. Quaternary Research Association, Cambridge.
- Bridgland, D.R. & Schreve, D.C. 2001. River terrace formation in synchrony with long-term climatic fluctuation: supporting mammalian evidence from southern Britain. In D. Maddy, M. Macklin & J. Woodward (ed's) *River Basins Sediments Systems: Archives of Environmental Change*: 229–248. Balkema, Rotterdam.
- Briggs, D.J., Coope, G.R. & Gilbertson, D.D. 1985. *The Chronology and Environmental Framework of Early Man and the Upper Thames Valley. A New Model*. British Archaeological Report, British Series 137. BAR, Oxford.
- Briggs, D.J., Gilbertson, D.D. & Harris, A.L. 1990. Molluscan taphonomy in a braided river environment and its implications for studies of Quaternary cold-stage river deposits. *Journal of Biogeography* 17: 623–637.
- Bristow, C. 1996. Reconstructing Fluvial Channel Morphology from Sedimentary Sequences. In P.A. Carling & M.R. Dawson (ed's) *Advances in Fluvial Dynamics and Stratigraphy*: 351–371. John Wiley & Sons Ltd, Chichester.
- Brown, A.G., Cooper, L., Salisbury, C.R. & Smith, D.N. 2001. Late Holocene channel changes of the Middle Trent: channel response to a thousand-year flood record. *Geomorphology* 39: 69–82.
- Bryant, I.D. 1983. The utilization of arctic river analogue studies in the interpretation of periglacial river sediments from southern Britain. In K.J. Gregory (ed.) *Background to Paleohydrology*: 413–431. Chichester, Wiley.
- Büdel, J. 1977. *Klima-Geomorphologie*. Gebrüder Borntraeger, Berlin.
- Bunn, H., Harris, J.W.K., Isaac, G., Kaufulu, Z., Kroll, E., Schick, K., Toth, N. & Behrensmeier, A.K. 1980. FxJj50: An Early Pleistocene Site in Northern Kenya. *World Archaeology* 12(1): 109–136.
- Callow, P. 1986. A Comparison of British and French Acheulean bifaces. In S.N. Collcutt (ed.) *The Palaeolithic of Britain and its Nearest Neighbours: Recent Trends*: 3–7. Department of Archaeology and Prehistory, University of Sheffield, Sheffield.
- Campbell, S.S. 1998. *Quaternary of South-West England*. Chapman Hall, London.
- Chambers, J.C. In prep. *The spatial modelling of Palaeolithic secondary context assemblages: case studies from the Solent River System and Axe River Valley, UK*. Unpublished PhD Thesis, University of Southampton.
- Charman, D.J. 2001. Biostratigraphic and palaeoenvironmental applications of testate amoebae. *Quaternary Science Reviews* 20: 1753–764.
- Church, M. & Hassan, M.A. 1992. Size and distance of unconstrained clasts on a streambed. *Water Resources Research* 28: 299–303.
- Clark, J.D. 1974. *Kalambo Falls prehistoric site. Volume 2*. Cambridge University Press, Cambridge.
- Clark, J.G.D. 1975. *The Earlier Stone Age Settlement of Scandinavia*. Cambridge University Press, Cambridge.
- Clayton, K.M. 1977. River Terraces. In F.W. Shotton (ed.) *British Quaternary Studies: Recent Advances*: 153–168.

- Clarendon Press, Oxford.
- Cleveringa, P., De Gans, W., Huybrechts, W. & Verbruggen, C. 1988. Outline of river adjustments in small river basins in Belgium and the Netherlands since the Upper Pleniglacial. In G. Lang & C. Schluchter (ed's) *Lake, Mire and River Environments During the Last 15000 Years*: 123–132. Balkema, Rotterdam.
- Collins, M. 2003. *Amino acid racemization dating of Quaternary sediments*. Paper presented at the ALSF Meeting on Techniques and Technical Developments in Aggregate-Related Archaeology, Keyworth (British Geological Survey), October 2003.
- Collins, P.E.F., Fenwick, I.M., Keith-Lucas, M.D. & Worsley, P. 1996. Late Devensian river and floodplain dynamics and related environmental change in northwest Europe, with particular reference to a site at Woolhampton, Berkshire, England. *Journal of Quaternary Science* 11(5): 357–375.
- Conway, B.W. 1969. Preliminary geological investigation of Boyn Hill Terrace deposits at Barnfield Pit, Swanscombe, Kent, during 1968. *Proceedings of the Royal Anthropological Institute for 1968*: 59–61.
- Conway, B., McNabb, J. & Ashton, N. (ed's). 1996. *Excavations at Barnfield Pit, Swanscombe 1968–1972*. British Museum Occasional Paper No. 94. British Museum, London.
- Coope, G.R. 1977. Quaternary Coleopteran as aids in the interpretation of environmental history. In F.W. Shotton (ed.) *British Quaternary Studies — recent advances*: 55–68. Oxford University Press, Oxford.
- Coope, G.R. 1987. The response of Late Quaternary insect communities to sudden climatic changes. In J.H.R. Gee & P.S. Giller (ed's) *Organisation of Communities, Past and Present*: 421–438. Blackwell Scientific, Oxford.
- Coope, G.R. 2001. Biostratigraphical distinction of interglacial coleopteran assemblages from southern Britain attributed to Oxygen Isotope Stages 5e and 7. *Quaternary Science Reviews* 20: 1717–1722.
- Coope, G.R. & Lister, A.M. 1987. Late glacial mammoth skeletons from Condover, Shropshire, England. *Nature* 330: 472–474.
- Cotswold Archaeological Trust. 2000. *Squabb Wood, Romsey, Hampshire. Project Design for an Archaeological Watching Brief*. Cotswold Archaeological Trust.
- Coulson, S.D. 1986. The Bout Coupé Handaxe as a Typological Mistake. In S.N. Collcutt (ed.) *The Palaeolithic of Britain and its Nearest Neighbours: Recent Trends*: 53–54. Department of Archaeology and Prehistory, University of Sheffield, Sheffield.
- Crossley, A.J., Wright, N.G. & Whitlow, C.D. 2003. Local time stepping for modelling open channel flows. *Journal of Hydraulic Engineering* 129(6): 455–462.
- Currant, A.P. 1989. The Quaternary origins of the modern British mammal fauna. *Biological Journal of the Linnean Society* 38: 22–30.
- Currant, A. & Jacobi, R. 2001. A formal mammalian biostratigraphy for the Late Pleistocene of Britain. *Quaternary Science Reviews* 20: 1707–1716.
- Dale, W. 1896. The Palaeolithic Implements of the Southampton Gravels. *Papers and Proceedings of the Hampshire Field Club and Archaeological Society* 3: 261–264.
- Dale, W. 1912a. On the Implement-bearing gravel beds of the lower valley of the Test. *Proceedings of the Society of Antiquaries* 24: 108–116.
- Dale, W. 1912b. Discussion. In E. Hull. On the Interglacial gravel beds of the Isle of Wight and the South of England, and the conditions of their formation (Abstract). *Quarterly Journal of the Geological Society of London* 68: 21–22.
- Dale, W. 1918. Report as Local Secretary for Hampshire. *Proceedings of the Society of Antiquaries* 30: 20–32.
- Dancey, C.L., Diplas, P., Papanicolaou, A. & Bala, M. 2002. Probability of individual grain movement and threshold condition. *Journal of Hydraulic Engineering* 128(12): 1069–1075.
- Davidson, I. & Noble, W. 1993. Tools and language in human evolution. In K.R. Gibson & T. Ingold (ed's) *Tools, language and cognition in human evolution*: 363–388. Cambridge University Press, Cambridge.
- Department of the Environment. 1989. *Minerals Planning Guidance 6: Guidelines for aggregates provision in England*. Department of the Environment, HMSO.
- Department of the Environment. 1990. *Planning Policy Guidance Note 16: Archaeology and Planning*. Department of the Environment, HMSO.
- Dincauze, D.F. 2000. *Environmental Archaeology: principles and practice*. Cambridge University Press, Cambridge.
- Dominguez-Rodrigo, M., Serrallonga, J., Juan-Tresserras, J., Alcalá, L. & Luque, L. 2001. Woodworking activities by early humans: a plant residue analysis on Acheulian stone tools from Peninj (Tanzania). *Journal of Human Evolution* 40: 289–299.
- Einstein, H.A. 1942. Formula for the transportation of bed-load. *Transactions of the American Society of Civil Engineers* 107.
- Einstein, H.A. 1950. *The bed-load function for sediment transportation in open channel flows*. United States Department of Agriculture, Soil Conservation Service, Technical Bulletin No 1026.
- Engelund, F. & Fredsøe, J. 1967. A sediment transport model for straight alluvial channels. *Nordic Hydrology* 7: 293–306.
- English Heritage. 1998. *Identifying and protecting Palaeolithic remains: Archaeological guidance for planning authorities and*

- developers. English Heritage, London.
- Evans, J. 1872. *The ancient stone implements, weapons and ornaments of Great Britain* (1<sup>st</sup> edition). Longmans, London.
- Evans, J. & O'Connor, T. 1999. *Environmental Archaeology: Principles and Methods*. Sutton, Stroud.
- Evans, P. 1971. Towards a Pleistocene time scale. The Phanerozoic time scale: a supplement. *Geological Society Special Publication* 5(2): 123–356.
- Féblot-Augustins, J. 1997. *La circulation des matières premières au Paléolithique*. Études et Recherches Archéologiques de l'Université de Liège No. 75. ERAUL, Liège.
- Fluck, H. 2002. *The Victoria West: an investigation into the prepared core technology of South Africa*. Unpublished MA Dissertation, University of Southampton.
- Foley, R. 1981. A model of regional archaeological structure. *Proceedings of the Prehistoric Society* 47: 1–17.
- Gamble, C.S. 1996. Hominid Behaviour in the Middle Pleistocene: an English Perspective. In C.S. Gamble & A.J. Lawson (ed's) *The English Palaeolithic Reviewed*: 61–71. Wessex Archaeology Ltd, Salisbury.
- Gamble, C.S. 1997. Review. The Skills of the Lower Palaeolithic World. *Proceedings of the Prehistoric Society* 63: 407–410.
- Gamble, C.S. & Roebroeks, W. 1999. The Middle Palaeolithic: a point of inflection. In W. Roebroeks & C.S. Gamble (ed's) *The Middle Palaeolithic Occupation of Europe*: 3–21. University of Leiden Press, Leiden.
- Gamble, C.S. 1999. *The Palaeolithic Societies of Europe*. Cambridge University Press, Cambridge.
- Gibbard, P.L. 1985. *The Pleistocene History of the Middle Thames Valley*. Cambridge University Press, Cambridge.
- Gibbard, P.L. 1994. *The Pleistocene History of the Lower Thames Valley*. Cambridge University Press, Cambridge.
- Gibbard, P.L. & Lewin, J. 2002. Climate and related controls on interglacial fluvial sedimentation in lowland Britain. *Sedimentary Geology* 151: 187–210.
- Giddens, A. 1984. *The constitution of society*. University of California Press, Berkeley.
- Gitins, S.R.D., Brewer, P.A. & Macklin, M.G. 2002. Exposed riverine sediment dynamics in mid-Wales rivers. In M.G. Macklin, P.A. Brewer & T.J. Coulthard (ed's) *River systems and environmental change in Wales: Field Guide*: 51–57. British Geomorphological Research Group, Aberystwyth.
- Gomez, B. & Church, M. 1989. An assessment of bedload sediment transport formulae from gravel bed rivers. *Water Resources Research* 25: 1161–1186.
- Goodwin, J.H. 1929. Part III. The Victoria West Industry. In J.H. Goodwin & C. van Riet Lowe. *The Stone Age Cultures of South Africa*. *Annals of the South African Museum* 27: 53–71.
- Gowlett, J.A.J. & Hallos, J. 2000. Beeches Pit: Overview of the Archaeology. In S.G. Lewis, C.A. Whiteman & R.C. Preece (ed's) *The Quaternary of Norfolk & Suffolk: Field Guide*: 197–206. Quaternary Research Association, London.
- Graf, W.H. & Cellino, M. 2002. Suspension flows in open channels: experimental study. *Journal of Hydraulic Research* 40(4): 435–447.
- Green, C.P. 1974. Pleistocene gravels of the River Axe in south-western England, and their bearing on the southern limit of glaciation in Britain. *Geological Magazine* 111: 213–220.
- Green, C.P. 1988. The Palaeolithic site at Broom, Dorset, 1932–41: from the record of C.E. Bean, Esq., F.S.A. *Proceedings of the Geologists' Association* 99: 173–180.
- Green, C.P. & McGregor, D.F.M. 1980. Quaternary evolution of the River Thames. In D.K.C. Jones (ed.) *The Shaping of Southern England*: 177–202. Academic Press, London.
- Green, C.P. & McGregor, D.F.M. 1987. River Terraces: a stratigraphic record of environmental change. In V. Gardiner (ed.) *International Geomorphology 1986 Part 1*: 977–987. Wiley, Chichester.
- Green, H.S. 1984. *Pontnewydd Cave: a lower Palaeolithic hominid site in Wales: the first report*. National Museum of Wales, Cardiff.
- Griffiths, H.I. 2001. Ostracod evolution and extinction – its biostratigraphic value in the European Quaternary. *Quaternary Science Reviews* 20: 1743–1751.
- Ham, D.G. & Church, M. 2000. Bed-material transport estimated from channel morphodynamics: Chilliwack River, British Columbia. *Earth Surface Processes and Landforms* 25: 1123–1142.
- Hardaker, T. 2001. New Lower Palaeolithic Finds from the Upper Thames. In S. Milliken & J. Cook (ed's) *A Very Remote Period Indeed: Papers on the Palaeolithic Presented to Derek Roe*: 180–198. Oxbow Books, Oxford.
- Hardaker, T. & MacRae, R.J. 2000. A Lost River and Some Palaeolithic Surprises: New Quartzite Finds from Norfolk and Oxfordshire. *Lithics: Newsletter of the Lithic Studies Society* 21: 52–59.
- Harding, P.A. 1998. An Interim Report of an Archaeological Watching Brief on Palaeolithic Deposits at Dunbridge, Hants. In N. Ashton, F. Healy & P. Pettitt (ed's) *Stone Age Archaeology: Essays in Honour of John Wymer*: 72–76. Oxbow Monograph 102 & Lithic Studies Society Occasional Paper No. 6. Oxbow Books, London.
- Harding, P., Gibbard, P.L., Lewin, J., Macklin, M.G. & Moss, E.H. 1987. The transport and abrasion of flint handaxes in a gravel-bed river. In G. de G. Sieveking & M.H. Newcomer (ed's) *The Human Uses of Flint and Chert: Proceedings of the Fourth International Flint Symposium Held at Brighton Polytechnic, Oct 15<sup>th</sup> April 1983*: 115–126. Cambridge University Press, Cambridge.
- Harvey, A. M., Oldfield, F. & Baron, A.F. 1981. Dating of post-glacial landforms in the Central Howgills. *Earth Surface Processes and Landforms* 6: 401–412.



- Harvey, A.M. & Renwick, W.H. 1987. Holocene alluvial fan and terrace formation in the Bowland Fells, Northwest England. *Earth Surface Processes and Landforms* 12: 249–257.
- Hassan, M.A. & Church, M. 2001. Sensitivity of bed load transport in Harris Creek: Seasonal and spatial variation over a cobble-gravel bar. *Water Resources Research* 37(3): 813–825.
- Hassan, M.A., Church, M. & Ashworth, P.J. 1992. Virtual Rate and Mean Distance of Travel of Individual Clasts in Gravel-Bed Channels. *Earth Surface Processes and Landforms* 17: 617–627.
- Hassan, M.A., Church, M. & Schick, A.P. 1991. Distance of Movement of Coarse Particles in Gravel Bed Streams. *Water Resources Research* 27(4): 503–511.
- Health & Safety Executive. 2003a. *A Review of Safety Passport Training Schemes*. Health & Safety Laboratory, Sheffield.
- Health & Safety Executive. 2003b. *Passport schemes for health, safety and the environment: a good practice guide*. Health & Safety Executive, Sheffield.
- Hosfield, R.T. 1999. *The Palaeolithic of the Hampshire Basin: a regional model of hominid behaviour during the Middle Pleistocene*. BAR British Series 286. Archaeopress, Oxford.
- Hosfield, R.T. 2001. The Lower Palaeolithic of the Solent: site formation and interpretive frameworks. In F.F. Wenban-Smith & R.T. Hosfield (ed's) *Palaeolithic Archaeology of the Solent River*: 85–97. Lithic Studies Society Occasional Paper 7. Lithic Studies Society, London.
- Hosfield, R.T. 2002. *The Archaeological Potential of Secondary Contexts (Project Design)*. Submitted to English Heritage (Aggregates Levy Sustainability Fund).
- Hosfield, R.T. In prep. Individuals among palimpsest data: a case study from southern England. In C.S. Gamble & M. Porr (ed's) *The Individual Hominid in Context: Archaeological Investigations of Lower and Middle Palaeolithic landscapes, locales and artefacts*. Routledge (Taylor & Francis).
- Hosfield, R.T., Chambers, J.C., Macklin, M.G., Brewer, P. & Sear, D. 2000. Interpreting Secondary Context Sites: A Role for Experimental Archaeology. *Lithics: The Newsletter of the Lithic Studies Society* 21: 29–35.
- Hosfield, R.T. & Chambers, J.C. 2002a. Processes and Experiences — Experimental Archaeology on a River Floodplain. In M.G. Macklin, P. A. Brewer & T. J. Coulthard (ed's) *River Systems and Environmental Change in Wales: Field Guide*: 32–39. British Geomorphological Research Group, Aberystwyth.
- Hosfield, R.T. & Chambers, J.C. 2002b. The Lower Palaeolithic site of Broom: geoarchaeological implications of optical dating. *Lithics: The Newsletter of the Lithic Studies Society* 23: 33–42.
- Hosfield, R.T. & Chambers, J.C. 2003. *Rivers gravels, flakes and handaxes: Experiments in site formation, stone tool transportation and transformation*. Paper presented at the 1<sup>st</sup> Conference of the European Association for the Advancement of Archaeology by Experiment (Vienna, 10–12<sup>th</sup> October 2003).
- Hosfield, R.T. & Chambers, J.C. 2004. Experimental Archaeology on the Afon Ystwyth, Wales, UK. *Antiquity* 78 (299): <http://antiquity.ac.uk/ProjGall/chambers/chambers.html>
- Hosfield, R.T. & Chambers, J.C. In prep. Secondary Contexts: Interpretive frameworks for the derived artefacts of the British Lower Palaeolithic. *Proceedings of the Prehistoric Society*.
- Hosfield, R.T., Toms, P., Chambers, J.C. & Green, C.P. In prep. Late Middle Pleistocene dates from the Broom Palaeolithic sites. *Journal of Quaternary Science*.
- Houben, P., Nolte, S., Rittweger, H. & Wunderlich, J. 2001. Lateglacial and Holocene environmental change indicated by floodplain deposits of the Hessian Depression (Central Germany). In D. Maddy, M.G. Macklin & J.C. Woodward (ed's) *River Basin Sediment Systems: Archives of Environmental Change*: 249–264. Balkema, Lisse.
- Houben, P. 2003. Spatio-temporally variable response of fluvial systems to Late Pleistocene climate change: a case study from central Germany. *Quaternary Science Reviews* 22: 2125–2140.
- Housley, R.A., Gamble, C.S., Street, M. & Pettitt, P. 1997. Radiocarbon evidence for the Lateglacial Human Recolonisation of Northern Europe. *Proceedings of the Prehistoric Society* 63: 25–54.
- Howard, A.J. & Macklin, M.G. 1999. A generic morphological approach to archaeological interpretation and prospection in British river valleys: a guide for archaeologists investigating Holocene landscapes. *Antiquity* 73: 527–541.
- Howard, A.J., Keen, D.H. & Hollin, J.T. 1999. Amino acid dating of a molluscan fauna from Bassingham Fen, Lincolnshire: implications for the chronology of the Trent terraces. *Proceedings of the Geologists Association* 110 (3): 233–239.
- Hubbard, R.N.L.B. 1982. The environmental evidence from Swanscombe, and its implications for Palaeolithic archaeology. In P.E. Leach (ed.) *Archaeology in Kent to AD 1500*: 3–7. Council for British Archaeology Research Report 48.
- Hunziker, R.P. & Jaeggi, M.N.R. 2002. Grain Sorting Processes. *Journal of Hydraulic Engineering* 128(12): 1060–1068.
- Hütt, G., Jaek, I. & Tchonka, J. 1988. Optical dating: K-feldspars optical response stimulation spectra. *Quaternary Science Reviews* 7: 381–386.
- Ingold, T. 1993. The temporality of the landscape. *World Archaeology* 25: 152–173.
- Institute of Field Archaeologists. 2001. *Standard and Guidance for an archaeological watching brief*. Institute of Field Archaeologists, London.
- Isaac, G.L. 1989. Towards the interpretation of occupation debris: some experiments and observations. In B. Isaac

- (ed.) *The Archaeology of Human Origins: Papers by Glynn Isaac*: 191–205. Cambridge University Press, Cambridge.
- Jacobi, R.M., Rowe, P.J., Gilmour, M.A., Grün, R. & Atkinson, T.C. 1998. Radiometric dating of the Middle Palaeolithic tool industry and associated fauna of Pin Hole Cave, Creswell Crags, England. *Journal of Quaternary Science* 13: 29–42.
- Johnstone, E., Macklin, M.G. & Brewer, P.A. 2002. Late Quaternary river terrace development in the Dyfi valley. In M.G. Macklin, P.A. Brewer & T.J. Coulthard (ed's) *River systems and environmental change in Wales: Field Guide*: 6–16. British Geomorphological Research Group, Aberystwyth.
- Jones, A.P., Tucker, M.E. & Hart, J.K. 1999. Guidelines and Recommendations. In A.P. Jones, M.E. Tucker & J.K. Hart (ed's) *The Description and Analysis of Quaternary Stratigraphic Field Sections*: 27–76. Technical Guide 7. Quaternary Research Association, London.
- Keen, D.H. 1990. Significance of the record provided by Pleistocene fluvial deposits and their included molluscan faunas for palaeontological reconstruction and stratigraphy: cases from the English Midlands. *Palaeogeography, Palaeoclimatology, Palaeoecology* 80: 25–34.
- Keen, D.H. 2001. Towards a late Middle Pleistocene non-marine molluscan biostratigraphy for the British Isles. *Quaternary Science Reviews* 20: 1657–1665.
- Kerney, M.P. 1968. Britain's fauna of land mollusca and its relation to the post-glacial thermal optimum. *Symposia of the Zoological Society, London* 22: 273–291.
- King, W.B.R. & Oakley, K.P. 1936. The Pleistocene succession in the lower part of the Thames valley. *Proceedings of the Prehistoric Society* 1: 52–76.
- Koenigswald, W. von & Kolfshoten, T. van. 1996. The *Miomys-Arvicola* boundary and the enamel thickness quotient (SDQ) of *Arvicola* as stratigraphic marker in the Middle Pleistocene. In C. Turner (ed.) *The Early Middle Pleistocene in Europe*: 211–226. Balkema, Rotterdam.
- Kozarski, S., Gonera, P. & Antczak, B. 1988. Valley floor development and paleohydrological changes: The Late Vistulian and Holocene history of the Warta River (Poland). In G. Lang & C. Schluchter (ed's) *Lake, Mire and River Environments During the Last 15000 Years*: 185–203. Balkema, Rotterdam.
- Lee, H.Y., Chen, Y.S., You, J.Y. & Lin, Y.T. 2000. Investigations of continuous bed load process. *Journal of Hydraulic Engineering* 126/9: 691–700.
- Lee, H.Y., Jiing-Yun, Y. & Tien Lin, Y. 2002. Continuous saltating process of multiple sediment particles. *Journal of Hydraulic Engineering* 128: 443–450.
- Lemdahl, G. 1991. A rapid climatic change at the end of the Younger Dryas in southern Sweden — palaeoclimatic and palaeoenvironmental reconstructions based on fossil insect assemblages. *Palaeogeography, Palaeoclimatology, Palaeoecology* 83: 313–331.
- Lewis, S.G. & Maddy, D. 1999. Description and Analysis of Quaternary Fluvial Sediments: a case study from the Upper River Thames, UK. In A.P. Jones, M.E. Tucker & J.K. Hart (ed's) *The Description and Analysis of Quaternary Stratigraphic Field Sections*: 111–135. Quaternary Research Association, London.
- Lewin, J. & Brewer, P.A. 2002. Laboratory Simulation of Clast Abrasion. *Earth Surface Processes and Landforms* 27: 145–164.
- Lister, A.M. 1992. Mammalian fossils and Quaternary biostratigraphy. *Quaternary Science Reviews* 11: 329–344.
- Lowe, J.J. & Walker, M.J.C. 1997. *Reconstructing Quaternary Environments* (2<sup>nd</sup> Edition). Pearson Education Limited, Harlow.
- Macklin, M.G. & Lewin, J. 1993. Holocene river alluviation in Britain. In I. Douglas & J. Hagedorn (ed.) *Geomorphology and Geoecology*: 109–122. Gebrüder Borntraeger, Berlin.
- Macklin, M.G. 1995. Archaeology and the river environment of Britain: a prospective review. In A.J. Barham & R.I. Macphail (ed's) *Archaeological sediments and soils: analysis, interpretation and management*: 205–220. Institute of Archaeology, London.
- Macklin, M.G., Brewer, P.A. & Coulthard, T.J. (ed's) 2002. *River systems and environmental change in Wales: Field Guide*. British Geomorphological Research Group, Aberystwyth.
- MacRae, R.J. 1988. The Palaeolithic of the Upper Thames Valley and its Quartzite Implements. In R.J. MacRae & N. Moloney (ed's) *Non-Flint Stone Tools and the Palaeolithic Occupation of Britain*: 49–65. British Archaeological Reports British Series 189. BAR, Oxford.
- MacRae, R.J. 1990. New Finds and Old Problems in the Lower Palaeolithic of the Upper Thames Valley. *Lithics: Newsletter of the Lithic Studies Society* 11: 3–15.
- MacRae, R.J. 1991. New Lower Palaeolithic Finds from Gravel Pits in Central Southern England. *Lithics: newsletter of the Lithic Studies Society* 12: 12–19.
- MacRae, R.J. 1999. New Lower Palaeolithic Finds in Norfolk. *Lithics: Newsletter of the Lithic Studies Society* 20: 3–9.
- Maddy, D. 1997. Uplift driven valley incision and river terrace formation in Southern England. *Journal of Quaternary Science* 12: 539–545.
- Maddy, D. & Bridgland, D.R. 2000. Accelerated uplift resulting from Anglian glacioisostatic rebound in the Middle Thames valley, UK? Evidence from the river terrace record. *Quaternary Science Review* 19: 1581–1588.
- Maddy, D., Bridgland, D.R. & Westaway, R. 2001. Uplift-driven valley incision and climate-controlled river terrace

- development in the Thames Valley, UK. *Quaternary International* 79: 23–36.
- Maddy, D., Keen, D.H., Bridgland, D.R. & Green, C.P. 1991. A revised model for the Pleistocene development of River Avon, Warwickshire. *Journal of the Geological Society of London* 148: 473–484.
- Maddy, D., Green, C.P., Lewis, S.G. & Bowen, D.Q. 1995. Pleistocene geology of the Lower Severn valley, UK. *Quaternary Science Reviews* 14: 209–222.
- Maddy, D., Lewis, S.G., Scaife, R.G., Bowen, D.Q., Coope, G.R., Green, C.P., Hardaker, T., Keen, D.H., Rees-Jones, J., Parfitt, S. & Scott, K. 1998. The Upper Pleistocene deposits at Cassington, near Oxford, England. *Journal of Quaternary Science* 13 (3): 205–231.
- Malmaeus, J.M. & Hassan, M.A. 2002. Simulation of Individual Particle Movement in a Gravel StreamBed. *Earth Surface Processes and Landforms* 27: 81–97.
- Markey, B.G., Bøtter-Jensen, L. & Duller, G.A.T. 1997. A new flexible system for measuring thermally and optically stimulated luminescence. *Radiation Measurements* 27: 83–89.
- Marshall, G.D. 2001. The Broom pits: a review of research and a pilot study of two Acheulean biface assemblages. In F.F. Wenban-Smith & R.T. Hosfield (ed's) *Palaeolithic Archaeology of the Solent River*. Lithic Studies Society Occasional Paper 7: 77–84. Lithic Studies Society, London.
- Martin, Y. & Church, M. 2000. Re-examination of Bagnold's empirical bedload formulae. *Earth Surface Processes and Landforms* 25: 1011–1024.
- Mayhew, D.F. 1977. Avian predators as accumulators of fossil mammal material. *Boreas* 6: 25–31.
- Mayle, F.E. & Cwynar, L.C. 1995. Impact of the Younger Dryas cooling event upon lowland vegetation of Maritime Canada. *Quaternary Science Reviews* 12: 295–306.
- McNabb, J. & Ashton, N. 1992. The Cutting Edge: Bifaces in the Clactonian. *Lithics: The Newsletter of the Lithics Studies Society* 13: 4–10.
- McNabb, J. 1996. More from the cutting edge: further discoveries of Clactonian bifaces. *Antiquity* 70(268): 428–436.
- Meinke, K. 1995. The development of the middle and lower course of the Weser river during the Late Pleistocene. In J. Hagedorn (ed.) *Late Quaternary and present-day fluvial processes in Central Europe*. 1–13. Gebrüder Borntraeger, Berlin.
- Mellars, P. 1996. *The Neanderthal Legacy*. University of Princeton Press, Princeton.
- Miall, A. D. 1996. *The Geology of Fluvial Deposits: Sedimentary Facies, Basin Analysis and Petroleum Geology*. Springer-Verlag, Berlin.
- Mitchell, G.F., Penny, L.F., Shotton, F.W. & West, R.G. (ed's). 1973. A correlation of Quaternary deposits in the British Isles. *Special Report of the Geological Society of London* 4: 1–99.
- Mithen, S. 1996. *Social learning and cultural tradition*. In J. Steele & S. Shennan (ed's) *The Archaeology of Human Ancestry*: 207–229. Routledge, London.
- Murphy, P.J. & Hooshiari, H. 1982. Saltation in water dynamics. *Journal of the Hydraulics Division of the American Society of Civil Engineers* 108: 1251–1267.
- Murray, A.S. & Roberts, R.G. 1997. Determining the burial time of single grains of quartz using optically stimulated luminescence. *Earth and Planetary Science Letters* 152: 163–180.
- Murray, A.S. & Wintle, A.G. 2000. Luminescence dating of quartz using an improved single-aliquot regenerative-dose protocol. *Radiation Measurements* 32: 57–73.
- Murray, J. 1985. *Modification of Experimental Flint Scatters by Fluvial Processes*. Unpublished BA Dissertation. Institute of Archaeology, University College London.
- Muste, M. 2002. Sources of bias errors in flume experiments on suspended-sediment transport. *Journal of Hydraulic Research* 40(6): 695–708.
- Nanson, G.C. & Croke, J.C. 1992. A genetic classification of floodplains. *Geomorphology* 4: 459–486.
- Newcomer, M.H. 1971. Some quantitative experiments in handaxe-axe manufacture. *World Archaeology* 3: 85–94.
- Nichols, G. 1999. *Sedimentology and Stratigraphy*. Blackwell Science Ltd., London.
- Niño, Y. & García, M. 1998. Experiments on saltation of sand in water. *Journal of Hydraulic Engineering* 124(10): 1014–1025.
- Ovey, C.D. (ed.). 1964. *The Swanscombe Skull. A survey of research on a Pleistocene Site*. Royal Anthropological Institute Occasional Paper No. 20. Royal Anthropological Institute of Great Britain & Ireland, London.
- Petit, J.R., Jouzel, J., Raynaud, D., Barkov, N.I., Barnola, J.-M., Basile, I., Benders, M., Chappellaz, J., Davis, M., Delaygue, G., Delmotte, M., Kotlyakov, V.M., Legrand, M., Lipenkov, V.Y., Lorius, C., Pepin, L., Ritz, C., Saltzman, E. & Stevenard, M. 1999. Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica. *Nature* 399: 429–436.
- Pike, K. & Goodwin, H. 1953. The interglacial at Clacton-on-Sea, Essex. *Quarterly Journal of the Geological Society of London* 108: 261–272.
- Ponel, P. & Coope, G.R. 1990. Lateglacial and early Flandrian Coleoptera from La Taphanel, Massif Central, France: climatic and ecological implications. *Journal of Quaternary Science* 5: 235–250.
- Pope, M. 2001. New Investigations at Slindon Bottom Palaeolithic Site, West Sussex: An Interim Report. *Lithics: The Newsletter of the Lithic Studies Society* 22: 3–10.

- Preece, R.C. 1995. Mollusca from interglacial sediments at three critical sites in the Lower Thames. In D.R. Bridgland, D. Allen & B.A. Haggert (ed's) *The Quaternary of the Lower Reaches of the Thames: Field Guide*: 53–62. Quaternary Research Association, London.
- Preece, R.C. 2001. Molluscan evidence for differentiation of interglacials within the 'Cromerian Complex'. *Quaternary Science Reviews* 20: 1643–1656.
- Prehistoric Society, The. 1999. *Research Frameworks for the Palaeolithic and Mesolithic of Britain and Ireland*. English Heritage, London.
- Prescott, J.R. & Hutton, J.T. 1994. Cosmic ray contributions to dose rates for luminescence and ESR dating: large depths and long-term time variations. *Radiation Measurements* 23: 497–500.
- Read, C.J. 1885. The Flint Implements of Bemerton and Milford Hill, near Salisbury. *Wiltshire Archaeological and Natural History Magazine* 22: 117–123.
- Reid Moir, J. 1936. Ancient Man in Devon. *Proceedings of the Devon Archaeological Exploration Society* 2: 264–275.
- Renfrew, C. & Bahn, P. 1996. *Archaeology: Theories, Methods, and Practice* (2<sup>nd</sup> edition). Thames & Hudson, London.
- Rhodes, E. 2003. *Luminescence dating: recent advances, new results*. Paper presented at the Palaeolithic-Mesolithic Day Meeting (London, 10<sup>th</sup>–11<sup>th</sup> April 2003).
- Roberts, R.G., Galbraith, R.F., Olley, J.M., Yoshida, H. & Laslett, G. M. 1999. Optical dating of single and multiple grains of quartz from Jinmium rock shelter (northern Australia): Part II, Results and implications. *Archaeometry* 41: 365–398.
- Roberts, M.B., Gamble, C.S. & Bridgland, D.R. 1995. The earliest occupation of Europe: the British Isles. In W. Roebroeks & T. van Kolfschoten (eds) *The Earliest Occupation of Europe (Proceedings of the European Science Foundation Workshop at Tautavel (France) 1993)*: 165–192. Institute of Prehistory, Leiden.
- Roberts, M.B. & Parfitt, S.A. 1998. *Boxgrove: a Middle Pleistocene hominid site at Eartham Quarry, Boxgrove, West Sussex*. English Heritage, London.
- Roe, D.A. 1968a. *Gazetteer for British Lower and Middle Palaeolithic Sites*. Council for British Archaeology, London.
- Roe, D.A. 1968b. British Lower and Middle Palaeolithic handaxe groups. *Proceedings of the Prehistoric Society* 34: 1–81.
- Roe, D.A. 1981. *The Lower and Middle Palaeolithic periods in Britain*. Routledge and Kegan Paul: London.
- Roe, H.M. 2001. The Late Middle Pleistocene biostratigraphy of the Thames Valley, England: new data from eastern Essex. *Quaternary Science Reviews* 20: 1603–1619.
- Roebroeks, W. 1996. The English Palaeolithic Record: Absence of Evidence, Evidence of Absence and the First Occupation of Europe. In C.S. Gamble & A.J. Lawson (ed's) *The English Palaeolithic Reviewed*: 57–62. Wessex Archaeology Ltd, Salisbury.
- Roebroeks, W., Conard, N.J. & van Kolfschoten, T. 1992. Dense forests, cold steppes and the Palaeolithic settlement of northern Europe. *Current Anthropology* 33: 551–586.
- Roebroeks, W. & Kolfschoten, T. van. 1995. The earliest occupation of Europe: the reappraisal of artefactual and chronological evidence. In W. Roebroeks & T. van Kolfschoten (eds) *The Earliest Occupation of Europe*: 297–315. University of Leiden, Leiden.
- Rose, J. 1979. River terraces and sea level change. *Brighton Polytechnic Geographic Society Magazine* 3: 13–30.
- Rose, J., Moorlock, B.S.P., Hamblin, R.J.O. 2001. Pre-Anglian fluvial and coastal deposits in Eastern England: lithostratigraphy and palaeoenvironments. *Quaternary International* 79: 5–22.
- Rose, J., Turner, C., Coope, G.R. & Bryan, M.D. 1980. Channel changes in a lowland river catchment over the last 13,000 years. In R.A. Cullingford, D.A. Davidson & J. Lewin (ed's) *Timescales in Geomorphology*: 159–175. John Wiley & Sons Ltd, Chichester.
- Rousseau, D-D. 1991. Climatic transfer function from Quaternary molluscs in European loess deposits. *Quaternary Research* 36: 195–209.
- Samaga, B.R. Ranga Raju, K.G. & Garde, R.J. 1986. Velocity Distribution in Alluvial Channel Flow. *Journal of Hydraulic Research* 24: 297–308.
- Sampson, C.G. (ed.). 1978. *Palaeoecology and Archaeology of an Acheulean Site at Caddington, England*. Department of Anthropology, Institute for the Study of Earth and Man, Southern Methodist University, Dallas.
- Scaife, R. Unpublished manuscript (2002). *Preliminary palynological analysis of the Railway Ballast Pit, Broom, UK*.
- Schick, K.D. 1986. *Stone Age Sites in the Making: Experiments in the Formation and Transformation of Archaeological Occurrences*. British Archaeological Reports (International Series 319). BAR, Oxford.
- Schick, K.D. & Toth, N. 1993. *Making Silent Stones Speak: Human Evolution and the Dawn of Technology*. Phoenix, London.
- Schirmer, W. 1988. Holocene valley development on the Upper Rhine and Main. In G. Lang & C. Schluchter (ed's) *Lake, Mire and River Environments During the Last 15000 Years*: 153–160. Balkema, Rotterdam.
- Schirmer, W. 1995. Valley bottoms in the late Quaternary. In J. Hagedorn (ed.) *Late Quaternary and present-day fluvial processes in Central Europe*: 27–51. Gebrüder Borntraeger, Berlin.
- Schmidt, K.-H. 1994. River Channel Adjustment and Sediment Budget in Response to a Catastrophic Flood Event (Lainbach Catchment, Southern Bavaria). In P. Ergenzinger & K.-H. Schmidt (ed's) *Dynamics and Geomorphology of Mountain Rivers*: 109–127. Springer-Verlag, Berlin.

- Schmidt, K-H. & Ergenzinger, P. 1992. Bedload entrainment, travel lengths, step lengths, rest periods studied with passive (iron, magnetic) and active (radio) tracer techniques. *Earth Surface Processes and Landforms* 17: 147–165.
- Schreve, D.C. 1997. *Mammalian biostratigraphy of the later Middle Pleistocene in Britain*. Unpublished Ph.D. thesis. University of London.
- Schreve, D.C. 2001a. Mammalian evidence from Middle Pleistocene fluvial sequences for complex environmental change at the oxygen isotope sub-stage level. *Quaternary International* 79: 65–74.
- Schreve, D.C. 2001b. Differentiation of the British late Middle Pleistocene interglacials: the evidence from mammalian biostratigraphy. *Quaternary Science Reviews* 20: 1693–1705.
- Schreve, D.C., Bridgland, D.R., Allen, P., Blackford, J.J., Fazakerley, R., Gleed-Owen, C.P., Griffiths, H.I., Keen, D.H. & White, M.J. 2002. Sedimentology, palaeontology and archaeology of late Middle Pleistocene River Thames terrace deposits at Purfleet, Essex, UK. *Quaternary Science Reviews* 21: 1423–1464.
- Schreve, D.C. & Bridgland, D.R. 2002. Correlation of English and German Middle Pleistocene fluvial sequences based on mammalian biostratigraphy. *Netherlands Journal of Geosciences* 81 (3–4): 357–373.
- Schreve, D.C. & Thomas, G.N. 2001. *Critical Issues in European Quaternary Biostratigraphy*. *Quaternary Science Reviews* 20: 1577–1582.
- Scott-Jackson, J.E. 1992. Lower Palaeolithic Finds at Wood Hill, East Kent: A Geological and Geomorphological Approach to an Archaeological Problem. *Lithics: The Newsletter of the Lithics Studies Society* 13: 1–16.
- Scott-Jackson, J.E. 2000. *Lower and Middle Palaeolithic artifacts from deposits mapped as clay-with-flints*. Oxbow Books, Oxford.
- Scourse, J.D. Unpublished manuscript (1982/1983). *Palaeobotany of the Railway Pit, Broom*.
- Scourse, J.D. 1984. Appendix. In R.A. Shakesby & N. Stephens. The Pleistocene gravels of Axe Valley, Devon. *Report of the Transactions of the Devon Association for the Advancement of Science* 116: 77–88.
- Sekine, M. & Kikkawa, H. 1992. Mechanics of Saltating Grains. *Journal of Hydraulic Engineering* 118(4): 536–558.
- Shackley, M.L. 1973. A contextual study of the Mousterian industry from Great Pan Farm, Isle of Wight. *Proceedings of the Isle of Wight Natural History and Archaeological Society* 6: 542–554.
- Shackley, M.L. 1974. Stream abrasion of flint implements. *Nature* 248: 501–502.
- Shackley, M.L. 1975. *A Study of the Mousterian of Acheulian Tradition Industries of Southern Britain*. Unpublished Ph.D. Thesis, University of Southampton.
- Shakesby, R.A. & N. Stephens, N. 1984. The Pleistocene gravels of Axe Valley, Devon. *Report of the Transactions of the Devon Association for the Advancement of Science* 116: 77–88.
- Shipman, P. 1981. *Life History of a Fossil*. Harvard University Press, Harvard.
- Singer, R., Wymer, J., Gladfelter, B.G. & Wolff, R.G. 1973. Excavation of the Clactonian Industry at the Golf Course, Clacton-on-Sea, Essex. *Proceedings of the Prehistoric Society* 39: 6–74.
- Singer, R., Gladfelter, B.G. & Wymer, J.J. 1993. *The Lower Palaeolithic site at Hoxne, England*. Chicago University Press, Chicago.
- Smith, R.A. 1926. *Guide to Antiquities of the Stone Age in the Department of the British and Medieval Antiquities*. British Museum, London (3<sup>rd</sup> edition).
- Smith, R.A. & Dewey, H. 1913. Stratification at Swanscombe: report on excavations made on behalf of the British Museum and H.M. Geological Survey. *Archaeologia* 64: 177–204.
- Smith, R.A. & Dewey, H. 1914. The High Terrace of the Thames: report on excavations made on behalf of the British Museum and H.M. Geological Survey in 1913. *Archaeologia* 65: 187–212.
- Sörgel, W. 1921. *Die Ursachen der diluvialen Aufschotterung und Erosion*. Berlin.
- Sparks, B.W. & West, R.G. 1970. Late Pleistocene deposits at Wretton, Norfolk. 1. Ipswichian interglacial deposits. *Philosophical Transactions of the Royal Society of London*, B258: 1–30.
- Starkel, L. 1988. Tectonic, anthropogenic and climatic factors in the history of the Vistula river valley downstream of Cracow. In G. Lang & C. Schluchter (ed's) *Lake, Mire and River Environments During the Last 15000 Years*: 161–170. Balkema, Rotterdam.
- Starkel, L. 2002. Change in the frequency of extreme events as the indicator of climatic change in the Holocene (in fluvial systems). *Quaternary International* 91: 25–32.
- Stephens, N. 1974. The Chard Area and Axe Valley Sections. *Quaternary Research Association Field Handbook: Exeter Meeting*: 46–51.
- Stephens, N. 1977. The Axe Valley. In D.N. Mottershead (ed.) *INQUA Congress Guidebook for Excursions. A6 and C6. South-West England*: 24–29. Geo Abstracts Ltd., Norwich.
- Stern, N. 1993. The Structure of the Lower Pleistocene Archaeological Record. *Current Anthropology* 43(3): 201–224.
- Stern, N. 1994. The implications of time-averaging for reconstructing the land-use patterns of early tool-using hominids. In J.S. Oliver, N.E. Sikes & K.M. Stewart (ed's) *Early Hominid Behavioural Ecology*: 89–105. Academic Press Limited, London.
- Stuart, A.J. 1979. Pleistocene occurrences of the European pond tortoise (*Emys orbicularis* Linnaeus) in Britain. *Boreas* 8: 359–371.
- Stuart, A.J. 1982. *Pleistocene Vertebrates in the British Isles*. Longman, London & New York.

- Sturge, W.A. 1912. The patina of flint implements. *Proceedings of the Prehistoric Society of East Anglia* 1: 140–157.
- Sumer, B.M., Kozakiewicz, A., Fredsøe, J. & Deigaard, R. 1996. Velocity and Concentration Profiles in Sheet-Flow Layer of Moveable Bed. *Journal of Hydraulic Engineering* 122: 549–558.
- Sumer, B.M., Chua, L.H.C., Cheng, N.S. & Fredsøe, J. 2003. Influence of turbulence on bed load sediment transport. *Journal of Hydraulic Engineering* 129(8): 585–596.
- Sutcliffe, A.J. 1976. Reply to R.G. West on The British Glacial–Interglacial Sequence. *Quaternary Newsletter* 18: 1–7.
- Sutcliffe, A.J. & Kowalski, K. 1976. Pleistocene Rodents of the British Isles. *Bulletin of the British Museum (natural History), Geology* 27/2.
- Thomas, G.N. 2001. Late Middle Pleistocene pollen biostratigraphy in Britain: pitfalls and possibilities in the separation of interglacial sequences. *Quaternary Science Reviews* 20: 1621–1630.
- Toms, P.S. 2002. *The acquisition of equivalent dose estimates from natural sedimentary quartz using optically stimulated luminescence*. Unpublished PhD thesis, University of London.
- Toms, P. 2003. *OSL Dating*. Paper presented at the ALSF Meeting on Techniques and Technical Developments in Aggregate-Related Archaeology, Keyworth (British Geological Survey), October 2003.
- Toms, P.S., Hosfield, R.T., Chambers, J.C. & Green, C.P. In prep. *Optical dating of the Broom Palaeolithic sites*. English Heritage Centre for Archaeology Report.
- Tuffreau, A. & Antoine, P. 1995. The earliest occupation of Europe: Continental Northwestern Europe. In W. Roebroeks & T. van Kolfschoten (ed's) *The Earliest Occupation of Europe: Proceedings of the European Science Foundation Workshop at Tautavel (France), 1993*: 147–163. University of Leiden, Leiden.
- Tyldesley, J.A. 1987. *The bout coupé handaxe: a typological problem*. British Archaeological Report (British Series 170). BAR, Oxford.
- Ussher, W.A.E. 1906. *The geology of the country between Wellington and Chard*. Memoir of the British Geological Survey, Sheet 311. HMSO, London.
- Vandenbergh, J. 1993. Changing fluvial processes under changing periglacial conditions. In I. Douglas & J. Hagedorn (ed's) *Geomorphology and Geocology: proceedings of the Second International Conference on Geomorphology, Frankfurt/Main 1989*: 17–28. Gebrüder Borntraeger, Berlin.
- Vandenbergh, J. 1995. Timescales, Climate and River Development. *Quaternary Science Reviews* 14: 631–638.
- Vandenbergh, J. 2001. A typology of Pleistocene cold-based rivers. *Quaternary International* 79: 111–121.
- Vandenbergh, J. 2002. The relation between climate and river processes, landforms and deposits during the Quaternary. *Quaternary International* 91: 17–23.
- Vandenbergh, J. 2003. Climate forcing of fluvial system development: an evolution of ideas. *Quaternary Science Reviews* 22: 2053–2060.
- van Andel, T.H. 2003. Glacial Environments I: the Weichselian Climate in Europe between the End of the OIS-5 Interglacial and the Last Glacial Maximum. In T.H. van Andel & W. Davies (ed's) *Neanderthals and modern humans in the European landscape during the last glaciation*: 9–19. McDonald Institute for Archaeological Research, Cambridge.
- T.H. van Andel & W. Davies (ed's). 2003. *Neanderthals and modern humans in the European landscape during the last glaciation*: 9–19. McDonald Institute for Archaeological Research, Cambridge.
- van Huissteden, J. 1990. Tundra rivers of the last glacial: sedimentation and geomorphological processes during the Middle Pleniglacial (Eastern Netherlands). *Mededelingen Rijks Geologische Dienst* 44(3): 1–138.
- van Huissteden, J., Gibbard, P.L. & Briant, R.M. 2001. Periglacial fluvial systems in northwest Europe during marine isotope stages 4 and 3. *Quaternary International* 79: 75–88.
- Van Rijn, L.C. 1984. Sediment transport, Part 1: bed load transport. *Journal of Hydraulic Engineering* 110/10: 1431–1456.
- Walker, M.J.C., Coope, G.R. & Lowe, J.J. 1993. The Devensian (Weichselian) Lateglacial palaeoenvironmental record from Gransmoor, East Yorkshire, England. *Quaternary Science Reviews* 12: 659–680.
- Watts, W.A. 1978. Plant macro-fossils and Quaternary Palaeoecology. In D. Walker & J.C. Guppy (ed's) *Biological and Quaternary Environments*: 53–68. Australian Academy of Science, Canberra.
- Watts, W.A., Allen, J.R.M. & Huntley, B. 1996. Vegetation history and palaeoclimate of the last glacial period at Lago Grande di Monticchio, southern Italy. *Quaternary Science Reviews* 15: 133–153.
- Wenban-Smith, F.F. 1990. The Location of Baker's Hole. *Proceedings of the Prehistoric Society* 56: 11–14.
- Wenban-Smith, F.F. 1992. Early Palaeolithic cultural facies and the Levalloisian at Baker's Hole. *Papers from the Institute of Archaeology* 3: 1–10.
- Wenban-Smith, F.F. 1996. *The Palaeolithic Archaeology of Baker's Hole: a case study for focus in lithic analysis*. Unpublished PhD Thesis, University of Southampton.
- Wenban-Smith, F.F. 1998. Clactonian and Acheulean Industries in Britain: Their Chronology and Significance Reconsidered. In N. Ashton, F. Healy & P. Pettitt (ed's) *Stone Age Archaeology: Essays in Honour of John Wymer*: 90–97. Oxbow Monograph 102 & Lithic Studies Society Occasional Paper No. 6. Oxbow Books, London.
- Wenban-Smith, F.F., Gamble, C.S. & ApSimon, A. 2000. The Lower Palaeolithic Site at Red Barns, Porchester: Bifacial technology, Raw Material Quality, and the Organisation of Archaic Behaviour. *Proceedings of the Prehistoric*

- Society* 66: 209–256.
- Wenban-Smith, F.F. & Hosfield, R.T. 2001. *Palaeolithic Archaeology of the Solent River*. Lithic Studies Society Occasional Paper No. 7. Lithic Studies Society, London.
- Wessex Archaeology. 1993a. *The Southern Rivers Palaeolithic Project: Report No. 1, 1991–1992. The Upper Thames Valley, the Kennett Valley and the Upper Solent Drainage System*. Wessex Archaeology & English Heritage, Salisbury.
- Wessex Archaeology. 1993b. *The Southern Rivers Palaeolithic Project Report No. 2. 1992–1993. The South West and South of the Thames*. Wessex Archaeology & English Heritage, Salisbury.
- Wessex Archaeology. 1994. *The Southern Rivers Palaeolithic Project. Report No. 3. 1993–1994. The Sussex Raised Beaches and the Bristol Avon*. Wessex Archaeology & English Heritage, Salisbury.
- Wessex Archaeology. 1996a. *The Welsh Lower Palaeolithic Survey. 1996*. Wessex Archaeology & CADW, Salisbury.
- Wessex Archaeology. 1996b. *The English Rivers Palaeolithic Project. Report No. 1. 1994–1995. The Thames Valley and the Warricksire Avon*. Wessex Archaeology & English Heritage, Salisbury.
- Wessex Archaeology. 1996c. *The English Rivers Palaeolithic Project. Report No. 2. 1995–1996. The Great Ouse Drainage and the Yorkshire and Lincolnshire Wolds*. Wessex Archaeology & English Heritage, Salisbury.
- Wessex Archaeology. 1997. *The English Rivers Palaeolithic Project. Report No. 3. 1996–1997. East Anglia Rivers and the Trent Drainage*. Wessex Archaeology & English Heritage, Salisbury.
- West, R.G. 1956. The Quaternary deposits at Hoxne, Suffolk. *Philosophical Transactions of the Royal Society of London B* 239: 265–356.
- West, R.G. 1957. Interglacial deposits at Bobbitshole, Ipswich. *Philosophical Transactions of the Royal Society of London B* 241: 1–31.
- West, R.G. 1977. Early and Middle Devensian flora and vegetation. *Philosophical Transactions of the Royal Society of London*, B280: 229–246.
- West, R.G., Andrew, R., Catt, J.A., Hart, C.P., Hollin, J.T., Knudsen, K.-L., Miller, G.F., Penney, D.N., Pettit, M.E., Preece, R.C., Switsur, V.R., Whiteman, C.A. & Zhou, L.P. 1999. Late and Middle Pleistocene deposits at Somersham, Cambridgeshire, UK: a model for reconstructing fluvial / estuarine depositional environments. *Quaternary Science Reviews* 18: 1247–1314.
- Westlake, E. 1902. *Note on Recent Discoveries of Palaeolithic and Eolithic Implements in the Valley of the Avon*. W. H. King and Son, Fordingbridge.
- Whately, R.C. 1993. Ostracoda as biostratigraphical indices in Cainozoic deep-sea sequences. In E.A. Hailwood & R.B. Kidd (ed's) *High Resolution Stratigraphy*: 155–167. Geographical Society Special Publications No. 70. Geographical Society, London.
- White, H.J.O. 1912. *The Geology of the Country around Winchester and Stockbridge*. Memoir of the Geological Survey of Great Britain. H.M.S.O, London.
- White, M.J. 1998a. Twisted Ovate Bifaces in the British Lower Palaeolithic: Some Observations and Implications. In N. Ashton, F. Healy & P. Pettitt (ed's) *Stone Age Archaeology: Essays in Honour of John Wymer*. 98–104. Oxbow Monograph 102 & Lithic Studies Society Occasional Paper No. 6. Oxbow Books, London.
- White, M.J. 1998b. On the significance of Acheulean biface variability in southern Britain. *Proceedings of the Prehistoric Society* 64: 15–45.
- White, M.J. 2000. The Clactonian Question: On the Interpretation of Core-and-Flake Assemblages in the British Lower Palaeolithic. *Journal of World Prehistory* 14(1): 1–63.
- White, M.J. & Jacobi, R.M. 2002. Two sides to every story: bout coupe handaxes revisited. *Oxford Journal of Archaeology* 21(2): 109–133.
- White, M.J. & Pettitt, P. 1995. Technology of early Palaeolithic western Europe: innovation, variability and a united framework. *Lithics: The Newsletter of the Lithic Studies Society* 16: 27–40.
- White, M.J. & Schreve, D.C. 2000. Island Britain – Peninsula Britain: Palaeogeography, Colonisation and the Lower Palaeolithic Settlement of the British Isles. *Proceedings of the Prehistoric Society* 66: 1–28.
- Wiberg, P.L. & Smith, J.D. 1985. A Theoretical Model for Saltating Grains in Water. *Journal of Geophysical Research* 90: 7341–7354.
- Wiberg, P.L. & Smith, J.D. 1989. A model for calculating bed load transport of sediment. *Journal of Hydraulic Engineering* 115(1): 101–123.
- Wilcock, P.R. 1997. Entrainment, displacement and transport of tracer gravels. *Earth Surface Processes and Landforms* 22: 1125–1138.
- Wilcock, P.R. 2001. Towards a practical method for estimating sediment-transport rates in gravel bed rivers. *Earth Surface Processes and Landforms* 26: 1395–1408.
- Wilkinson 2001. Prospecting the Palaeolithic: strategies for the archaeological investigation of Middle Pleistocene deposits in Southern England. In F.F. Wenban-Smith & R.T. Hosfield (ed's) *Palaeolithic Archaeology of the Solent River*. 99–110. Lithic Studies Society Occasional Paper 7. Lithic Studies Society, London.
- Winton, V. 2001. Unexpected results from experimentation with handaxes. Paper presented at the *Palaeolithic–Mesolithic Day Meeting*, British Museum, London, September 2001.
- Wymer, J.J. 1968. *Lower Palaeolithic Archaeology in Britain, as Represented by the Thames Valley*. John Baker, London.

- Wymer, J.J. 1974. Clactonian and Acheulean industries in Britain: their chronology and significance. *Proceedings of the Geologists Association* 85: 391–421.
- Wymer, J.J. 1977. A chert hand-axe from Chard, Somerset. *Proceedings of the Somerset Natural History and Archaeological Society* 120: 101–103.
- Wymer, J.J. 1999. *The Lower Palaeolithic Occupation of Britain*. Wessex Archaeology, Salisbury.
- Wymer, J.J., Lewis, S.G. & Bridgland, D.R. 1991. Warren Hill, Mildenhall, Suffolk (TL 744743). In S.G. Lewis, C.A. Whiteman & D.R. Bridgland (ed's) *Central East Anglia and the Fen Basin*: 50–58. Quaternary Research Association, London.
- Yang, S-Q. & Lim, S-Y. 2003. Total load transport formula for flow in alluvial channels. *Journal of Hydraulic Engineering* 129(1): 68–72.
- Zeuner, F.E. 1958. *Dating the Past: An Introduction to Geochronology* (4<sup>th</sup> edition). Methuen and Co. Ltd., London.
- Zeuner, F.E. 1959. *The Pleistocene Period* (2<sup>nd</sup> edition). Hutchinson, London.