# Quaternary of the Thames

### D.R. Bridgland

Bridgland Earth Science Consultancy, Darlington, UK.

Scientific Editor: D. Q. Bowen GCR Editor: W. A. Wimbledon





London · Glasgow · New York · Tokyo · Melbourne · Madras

## References

- Abbott, W.J.L. (1890) Notes on some Pleistocene sections in and near London. *Proceedings of the Geologists' Association*, **11**, 473–80.
- Abbott, W.J.L. (1911) On the classification of the British Stone Age industries and some new, and little known well marked horizons and cultures. Journal of the Royal Anthropological Institute, 41, 458–81.
- Allen, P. (1983) Middle Pleistocene stratigraphy and landform development in south-east Suffolk. Unpublished Ph.D. thesis, University of London.
- Allen, P. (1984) *Field Guide to the Gipping and Waveney Valleys*, Quaternary Research Association, Cambridge, 116 pp.
- Allen, P. (1991) Deformation structures in British Pleistocene sediments. In *Glacial Deposits in Great Britain and Ireland* (eds J. Ehlers, P.L. Gibbard and J. Rose), A.A. Balkema, Rotterdam, pp. 455–69.
- Allen, P., Cheshire, D.A. and Whiteman, C.A. (1991) Glacial deposits of southern East Anglia. In *Glacial Deposits in Great Britain* and Ireland (eds J. Ehlers, P.L. Gibbard and J. Rose), A.A. Balkema, Rotterdam, pp. 255– 78.
- Allen, T. (1977) Interglacial sea-level change: evidence for brackish water sedimentation at Purfleet, Essex. *Quaternary Newsletter*, **22**, 1–3.
- Allen, T.J. (1978) Disposition of the terraces of the River Thames in the vicinity of Yiewsley. In *Early Man in West Middlesex* (ed. D. Collins), HMSO, London, pp. 5–10.
- Almaine, H.G.W.D. (1922) Palaeolithic gravel near Abingdon. *Antiquaries Journal*, 2, 257–8.

Artest (2000) Statistical and a statistical and a statistic for a statistical and a

- Ambrose, J.D. (1973) The sand and gravel resources of the country around Maldon, Essex. Report of the Institute of Geological Sciences, 73/1.
- Anon. (1906) Flint implements and fossils from Clacton. *Essex Naturalist*, 14, 164.
- Anon. (1908) Palaeolithic flint implement from a gravel pit, Handborough, Oxon. Oxford University Gazette, 38, 752.
- Anon. (1911a) Visit to Clacton-on-Sea, and 301st ordinary meeting. Saturday, 30th September 1911. Essex Naturalist, 16, 322–4.
- Anon. (1911b) Exhibition by S.H. Warren of plaster casts of Palaeolithic wooden spear (?) and some flint-flakes from a Pleistocene deposit at Clacton-on-Sea. *Essex Naturalist*, 16, 326.
- Anon. (1913) Excursion to Mersea Island (the 427th Meeting), Saturday, 20th September 1913. Essex Naturalist, 17, 229–34.
- Anon. (1931) The Newton Collection. Antiquaries Journal, 11, 420-1.
- Anon. (1966) The Aveley elephants. Report of the British Museum (Natural History) [for 1963–1965], pp. 30–1.
- Anon. (1982a) Waltham Cross, Hertfordshire. Earth Science Conservation, 19, 35.
- Anon. (1982b) Hornchurch, Essex. Earth Science Conservation, 19, 35.
- Anon. (1984a) Hornchurch railway cutting. Earth Science Conservation, 21, 42.
- Anon. (1984b) Globe Pit SSSI, Essex. *Earth Science Conservation*, **21**, 39–40.
- Arkell, W.J. (1943) The Pleistocene rocks at Trebetherick Point, north Cornwall; their interpretation and correlation. *Proceedings* of the Geologists' Association, 54, 41–170.

- Arkell, W.J. (1945) Three Oxfordshire palaeoliths and their significance for Pleistocene correlation. *Proceedings of the Prehistoric Society*, 2, 20–31.
- Arkell, W.J. (1947a) *The Geology of Oxford*, Clarendon Press, Oxford, 268 pp.
- Arkell, W.J. (1947b) The geology of the Evenlode Gorge, Oxfordshire. *Proceedings of the Geologists' Association*, 58, 87–113.
- Arkell, W.J. (1947c) A palaeolith from the Hanborough Terrace. Oxoniensia, 11-12, 1-4.
- Arkell, W.J. and Oakley, K.P. (1948) The implements in the Treacher Collection. *In* On the ancient channel between Caversham and Henley, Oxfordshire, and its contained flint implements. *Proceedings of the Prebistoric Society*, 14, 126–54.
- Avery, B.W. and Catt, J.A. (1983) Northaw Great Wood. In *The Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 96–101.
- Baden-Powell, D.F.W. (1948) The chalky boulder clays of Norfolk and Suffolk. *Geological Magazine*, **85**, 279–96.
- Baden-Powell, D.F.W. (1949) Experimental Clactonian technique. Proceedings of the Prebistoric Society, 15, 38–41.
- Baden-Powell, D.F.W. (1950) The Pliocene-Pleistocene boundary in the British deposits.
  In *The Pliocene-Pleistocene boundary* (ed. K.P. Oakley), International Geological Congress 18th session [G.B., 1948], Vol. 9, pp. 8–10.
- Baden-Powell, D.F.W. (1951) The age of interglacial deposits at Swanscombe. *Geological Magazine*, 88, 344–56.
- Baden-Powell, D.F.W. (1955) Appendix B: Report on the marine fauna of the Clacton Channels. In Warren, S.H., The Clacton (Essex) channel deposits. *Quarterly Journal* of the Geological Society of London, 111, 301–5.
- Baker, C.A. (1971) A contribution to the glacial stratigraphy of west Essex. *Essex Naturalist*, 32, 318–30.
- Baker, C.A. (1977) Quaternary stratigraphy and environments in the Upper Cam valley. Unpublished Ph.D. thesis, University of London.
- Baker, C.A. (1983) Glaciation and Thames diversion in the Mid-Essex Depression. In *The Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 39–49.

- Baker, C.A. and Jones, D.K.C. (1980) Glaciation of the London Basin and its influence on the drainage pattern: a review and appraisal. In *The Shaping of Southern England* (ed. D.K.C. Jones), Institute of British Geographers Special Publication 11, Academic Press, London, pp. 131–76.
- Barrow, G. (1919a) Some future work for the Geologists' Association. *Proceedings of the Geologists' Association*, **30**, 1–48.
- Barrow, G. (1919b) Notes on the correlation of the deposits described in Mr C. J. Gilbert's paper with the high-level gravels of the south of England (or the London Basin). *Quarterly Journal of the Geological Society of London*, 75, 44–50.
- Barrow, G. (1919c) Excursion to Stanmore Hill and Bushey Heath. Proceedings of the Geologists' Association, 30, 122–6.
- Bell, A.M. (1894a) Palaeolithic remains at Wolvercote, Oxfordshire, I and II. Antiquary, 30, 148–52 and 192–8.
- Bell, A.M. (1894b) On the Pleistocene gravels at Wolvercote near Oxford. *Report of the British* Association, Oxford, pp. 663–4.
- Bell, A.M. (1904) Implementiferous sections at Wolvercote (Oxfordshire). *Quarterly Journal* of the Geological Society of London, 60, 120-32.
- Bell, F.G. (1969) The occurrence of southern, steppe and halophyte elements in Weichselian (last glacial) floras from southern Britain. *New Phytologist*, **68**, 913–22.
- Bennett, K.D., Peglar, S.M. and Sharp, M.J. (1991) Holocene lake sediments in central East Anglia. In *Central East Anglia and the Fen Basin* (eds S.G. Lewis, C.A. Whiteman and D.R. Bridgland), Field Guide, Quaternary Research Association, London, pp. 111–118.
- Berckhemer, F. (1933) Ein Menschen-Schädel aus den diluvialen Schottern von Steinheim a.d. Murr. Anthropologische Anzeiger, 10, 318–21.
- Bishop, M.J. (1982) The mammal fauna of the early Middle Pleistocene cavern infill site of Westbury-sub-Mendip, Somerset. Special Papers in Palaeontology, 28, 1–108.
- Bishop, W.W. (1958) The Pleistocene geology and geomorphology of three gaps in the Middle Jurassic escarpment. *Philosophical Transactions of the Royal Society of London*, B241, 255–306.
- Blair, K.G. (1923) Some coleopterous remains from the peat-bed at Wolvercote, Oxford-

shire. Transactions of the Royal Entomological Society of London, 71, 558–63.

- Blake, J.H. (1891) Excursion to Henley-on-Thames and Nettlebed. *Proceedings of the Geologists' Association*, 12, 204–6.
- Blake, J.H. (1900) Excursion to Silchester. Proceedings of the Geologists' Association, 16, 513-6.
- Blake, J.H. (1903) *The Geology of the Country around Reading*. Memoir of the Geological Survey of Great Britain, 91 pp.
- Blezard, R.G. (1966) Field meeting at Aveley and West Thurrock. *Proceedings of the Geologists' Association*, 77, 273–6.
- Blezard, R.G. (1973) South Essex. In *The Estuarine Region of Suffolk and Essex* (eds J.T. Greensmith, R.G. Blezard, C.R. Bristow *et al.*), Geologists' Association Guide. Benham, Colchester, pp. 35–41.
- Boswell, P.G.H. (1940) Climates of the past: a review of the geological evidence. *Quarterly Journal of the Royal Meteorological Society of London*, **66**, 249–74.
- Boswell, P.G.H. (1952) The Pliocene-Pleistocene boundary in the east of England. *Proceedings* of the Geologists' Association, 63, 301–12.
- Bowen, D.Q. (1978) *Quaternary Geology: A Stratigraphic Framework for Multidisciplinary Work*, Pergamon Press, Oxford, 237 pp.
- Bowen, D.Q. (1989) The last interglacial-glacial cycle in the British Isles. *Quaternary International*, 3/4, 41–7.
- Bowen, D.Q. (1991) Amino acid geochronology. In *Central East Anglia and the Fen Basin* (eds S.G. Lewis, C.A. Whiteman and D.R. Bridgland), Field Guide, Quaternary Research Association, London, pp. 21–4.
- Bowen, D.Q., Sykes, G.A., Reeves, A., *et al.* (1985) Amino acid geochronology of raised beaches in south west Britain. *Quaternary Science Reviews*, 4, 279–318.
- Bowen, D.Q., Hughes, S.A., Sykes, G.A., *et al.* (1989) Land-sea correlations in the Pleistocene based on isoleucine epimerization in non-marine molluscs. *Nature, London*, 340, 49–51.
- Bowen, D.Q., Rose, J., McCabe, A.M., *et al.* (1986a) Correlation of Quaternary glaciations in England, Ireland, Scotland and Wales. *Quaternary Science Reviews*, **5**, 299–340.
- Bowen, D.Q., Richmond, G.M., Fullerton, D.S., et al. (1986b) Correlation of Quaternary glaciations in the Northern Hemisphere.

*Quaternary Science Reviews*, **5**, 509–10 + loose figures.

- Bowen, D.Q. and Sykes, G.A. (1988) Correlation of the marine events and glaciations on the north-east Atlantic margin. *Philosophical Transactions of the Royal Society of London*, B318, 619–35.
- Breitinger, E. (1952) Zur Morphologie und systematischen Stellung des Schädelfragmentes von Swanscombe. *Homo*, **3**, 131–3.
- Breitinger, E. (1955) Das Schädelfragment von Swanscombe und das 'Praesapiensproblem'. Mitteilungen der Antbropologischen Gesellschaft Wien, 84/85, 27–38.
- Breitinger, E. (1964) Reconstruction of the Swanscombe skull. In *The Swanscombe Skull: a Survey of Research on a Pleistocene Site*, (ed. C.D. Ovey), Royal Anthropological Institute, Occasional Paper No. 20, 161–72. Translated by D.M. Watson from: Das Schädelfragment von Swanscombe und das 'Praesapiensproblem'. *Mitteilunger der Antbropologischen Gesellschaft Wien*, 84/85, 27–38.
- Breuil, H. (1932a) Appendix in Sandford, K.S., The Pleistocene succession in England. *Geological Magazine*, 69, 17–18.
- Breuil, H. (1932b) Les industries à éclats du Palaéolithique ancien, I: Le Clactonien. Prébistoire, Paris, 1, 148–57.
- Breuil, H. (1934) De l'importance de la solifluction dans l'étude des terrains Quaternaires de la France et des pays voisins. *Revue de Géographie Physique et de Géologie Dynamique*, 7, 269–331.
- Breuil, H. (1947) Age of the Baker's Hole Coombe Rock, Northfleet, Kent. *Nature*, *London*, **160**, 831.
- Bridgland, D.R. (1980) A reappraisal of Pleistocene stratigraphy in north Kent and eastern Essex, and new evidence concerning the former courses of the Thames and Medway. *Quaternary Newsletter*, **32**, 15–24.
- Bridgland, D.R. (1983a) The Quaternary fluvial deposits of north Kent and eastern Essex. Unpublished Ph.D. thesis, City of London Polytechnic, 2 volumes.
- Bridgland, D.R. (1983b) Eastern Essex. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Reasearch Association, Cambridge, pp. 170–84.
- Bridgland, D.R. (1985a) Pleistocene sites in the Thames-Avon system. *Earth Science Conservation*, 22, 36–9.

- Bridgland, D.R. (1985b) Uniclinal shifting; a speculative reappraisal based on terrace distribution in the London Basin. *Quaternary Newsletter*, 47, 26–33.
- Bridgland, D.R. (1986a) Discussion of procedures and recommendations. In *Clast Lithological Analysis* (ed. D.R. Bridgland), Technical Guide No. 3, Quaternary Research Association, Cambridge, pp. 1–33.
- Bridgland, D.R. (1986b) The rudaceous components of the East Essex Gravels; their characteristics and provenance. *Quaternary Studies*, 2, 34–44.
- Bridgland, D.R. (1986c) The provenance of gravel at Great Fanton Hall, near Wickford, Essex. In *Clast Lithological Analysis* (ed. D.R. Bridgland), Technical Guide No. 3, Quaternary Research Association, Cambridge, pp. 147–52.
- Bridgland, D.R. (1988a) The Pleistocene fluvial stratigraphy and palaeogeography of Essex. *Proceedings of the Geologists' Association*, 99, 291–314.
- Bridgland, D.R. (1988b) Problems in the application of lithostratigraphic classification to Pleistocene terrace deposits. *Quaternary Newsletter*, **55**, 1–8.
- Bridgland, D.R. (1988c) The Quaternary derivation of quartzites used by Palaeolithic Man in the Thames Basin for tool manufacture. *In* Non-flint stone tools and the Palaeolithic occupation of Britain, *British Archaeological Report, British Series*, **189**, 187–98.
- Bridgland, D.R. (1990a) Pleistocene stratigraphy and river basin sediments: a reply to D. Maddy and C.P. Green. *Quaternary Newsletter*, **60**, 10–2.
- Bridgland, D.R. (1990b) Little Oakley (TM 223294), In *The Cromer Symposium Field Excursion Guidebook* (ed. C. Turner), Symposium of European Quaternary Stratigraphy/Quaternary Research Association, Cambridge, pp. 48–57.
- Bridgland, D.R. and D'Olier, B. (1987) Attempted correlation of onshore and offshore Thames channels and terraces in the eastern London Basin and the southern North Sea. *Programme and Abstracts XII INQUA Congress* [July 1987], pp. 136.
- Bridgland, D.R. and D'Olier, B. (1989) A preliminary correlation of the onshore and offshore courses of the Rivers Thames and Medway during the Middle and Upper Pleistocene. In *Quaternary and Tertiary*

Geology of the Southern Bight, North Sea (eds J.P. Henriet and G. De Moor), Belgian Ministry of Economic Affairs, Geological Survey, 161–72.

- Bridgland, D.R. and Gibbard, P.L. (1990) Ardleigh (Martell's Quarry) TM053280. In *The Cromer Symposium Field Excursion Guidebook* (ed. C. Turner), Symposium of European Quaternary Stratigraphy/Quaternary Research Association, Cambridge, 57–62.
- Bridgland, D.R. and Harding, P. (1985) Palaeolithic artifacts from the gravels of the Hoo Peninsula. Archaeologia Cantiana, 101, 41–55.
- Bridgland, D.R. and Harding, P. (1986) An attempt to locate the 'Wolvercote Channel' in the railway cutting adjacent to Wolvercote Brick Pit. *Quaternary Newsletter*, **48**, 12–6.
- Bridgland, D.R. and Lewis, S.G. (1991) Introduction to the Pleistocene geology and drainage history of the Lark valley. In *Central East Anglia and the Fen Basin* (eds S.G. Lewis, C.A. Whiteman and D.R. Bridgland), Field Guide, Quaternary Research Association, London, pp. 37–44.
- Bridgland, D.R., Gibbard, P.L., Harding, P., et al. (1985) New information and results from recent excavations at Barnfield Pit, Swanscombe. *Quaternary Newsletter*, 46, 25–39.
- Bridgland, D.R., Allen, P., Currant, A.P., et al. (1988) Report of the Geologists' Association field meeting in north-east Essex, May 22nd-24th, 1987. Proceedings of the Geologists' Association, 99, 315-33.
- Bridgland, D.R., Keen, D.H. and Maddy, D. (1989) The Avon Terraces: Cropthorne, Ailstone and Eckington. In *West Midlands* (ed. D.H. Keen), Field Guide, Quaternary Research Association, Coventry, pp. 51–67.
- Bridgland, D.R., Gibbard, P.L. and Preece, R.C. (1990) The geology and significance of the interglacial sediments at Little Oakley, Essex. *Philosophical Transactions of the Royal Society of London*, **B328**, 307–39.
- Bridgland, D.R., D'Olier, B., Gibbard, P.L. and Roe, H.M. (1993) Correlation of Thames terrace deposits between the lower Thames, eastern Essex and the submerged offshore continuation of the Thames-Medway valley. *Proceedings of the Geologists' Association*, 104, 51–58.
- Briggs, D.J. (1973) Quaternary deposits of the Evenlode valley and adjacent areas. Unpublished Ph.D. thesis, University of Bristol.

- Briggs, D.J. (1976a) River terraces of the Oxford area. In *Field Guide to the Oxford Region* (ed. D. Roe), Quaternary Research Association, Oxford, pp. 8–15.
- Briggs, D.J. (1976b) Some Quaternary problems in the Oxford area. In *Field Guide to the Oxford Region* (ed. D. Roe), Quaternary Research Association, Oxford, pp. 6–7.
- Briggs, D.J. (1988) The environmental background to human occupation in the Upper Thames valley during the Quaternary Period. *In* Non-flint stone tools and the Palaeolithic occupation of Britain (eds R.J. MacRae and N. Moloney), *Britisb Archaeological Report*, *Britisb Series*, 189, 167–86.
- Briggs, D.J. and Gilbertson, D.D. (1973) The age of the Hanborough Terrace of the River Evenlode, Oxfordshire. *Proceedings of the Geologists' Association*, 84, 155–73.
- Briggs, D.J. and Gilbertson, D.D. (1974) Recent studies of Pleistocene deposits in the Evenlode valley and adjacent areas of the Cotswolds. Sound [Journal of the Plymouth Polytechnic Geological Society], 3, 7–22.
- Briggs, D.J. and Gilbertson, D.D. (1980) Quaternary processes and environments in the Upper Thames basin. *Transactions of the Institute of British Geographers*, **5**, 53–65.
- Briggs, D.J., Coope, G.R. and Gilbertson, D.D. (1975a) Late Pleistocene terrace deposits at Beckford, Worcestershire, England. *Geological Journal*, 10, 1–16.
- Briggs, D.J., Gilbertson, D.D., Goudie, A.S., *et al.* (1975) New interglacial site at Sugworth. *Nature, London*, **257**, 477–9.
- Briggs, D.J., Coope, G.R. and Gilbertson, D.D. (1985) The chronology and environmental framework of early Man in the Upper Thames Valley: a new model. *British Archaeological Report, British Series*, **137**, 176 pp.
- Bristow, C.R. (1985) *The Geology of the Country around Chelmsford*. Memoir of the Geological Survey of Great Britain, 108 pp.
- Bristow, C.R. and Cox, F.C. (1973) The Gipping Till: a reappraisal of East Anglian glacial stratigraphy. *Journal of the Geological Society of London*, **129**, 1–37.
- Bromehead, C.E.N. (1912) On diversions of the Bourne near Chertsey. Summary of Progress, Geological Survey of Great Britain [for 1911], pp. 74–7.
- Bromehead, C.E.N. (1925) *The Geology of North London*. Memoir of the Geological Survey of Great Britain, 63 pp.

- Brown, E.H. (1975) The Quaternary terraces of the River Thames. In L'évolution Quaternaire des Bassins Fluviaux de la Mer du Nord Méridionale (ed. P. Macar), Société Géologique de Belgique, Liege, 318 pp.
- Brown, J. (1838) Discovery of a large pair of fossil horns in Essex. Magazine of Natural History, Series 2, 2, 163–4.
- Brown, J. (1839) Fossil bones at Clacton. *Essex Literary Journal* [for 1839], 29.
- Brown, J. (1840) Notice of a fluvio-marine deposit containing mammalian-remains occurring in the parish of Little Clacton on the Essex coast. *Magazine of Natural History*, *Series 2*, 4, 197–201.
- Brown, J. (1841) A list of the fossil shells found in a fluvio-marine deposit at Clacton in Essex. Annals and Magazine of Natural History, Series 1, 7, 427–9.
- Brown, J. (1845) On certain conditions and appearances of the strata on the coast of Essex near Walton. *Quarterly Journal of the Geological Society of London*, 1, 341–2.
- Brown, J. (1857) Note on bovine remains, lately found at Clacton, Essex. Annals and Magazine of Natural History, Series 2, 20, 397–8.
- Brunnacker, K. (1986) Quaternary stratigraphy in the Lower Rhine area and northern Alpine foothills. *Quaternary Science Reviews*, 5, 373–9.
- Brunnacker, K., Löscher, M., Tillmanns, W., et al. (1982) Correlation of the Quaternary terrace sequences in the Lower Rhine valley and northern Alpine foothills of central Europe. Quaternary Research, 18, 152–73.
- Bryant, I.D. (1983) Facies sequences associated with some braided river deposits of late-Pleistocene age from southern Britain. In Modern and Ancient Fluvial Systems: Sedimentology and Processes (eds J.D. Collinson and J. Lewin), International Association of Sedimentologists, Special Publication, No. 6, pp. 267–75.
- Bryant, I.D. and Holyoak, D.T. (1980) Devensian deposits at Brimpton, Berkshire. *Quaternary Newsletter*, **30**, 17.
- Bryant, I.D., Holyoak, D.T. and Moseley, K.A. (1983) Late Pleistocene deposits at Brimpton, Berkshire, England. *Proceedings of the Geologists' Association*, 94, 321–43.
- Buckland, W. (1823) Reliqiae Diluvianae: or Observation on the Organic Remains Contained in Caves, Fissures and Diluvial Gravel and on Other Geological Pheno-

mena, Attesting the Action of a Universal Deluge. John Murray, London, 303 pp.

- Buckman, S.S. (1897) Deposits of the Bajocian age in the northern Cotteswolds: The Cleeve Hill Plateau. Quarterly Journal of the Geological Society of London, 53, 607–29.
- Buckman, S.S. (1899a) Gravel at Moreton-in-Marsh, Gloucestershire. Quarterly Journal of the Geological Society of London, 55, 220–3.
- Buckman, S.S. (1899b) The development of rivers; and particularly the genesis of the Severn. *Natural Science*, 14, 273–89.
- Buckman, S.S. (1900) Excursion notes: chiefly on river features. Salisbury meeting. Proceedings of the Cotteswold Naturalists Field Club, 13, 175–92.
- Bull, A.J. (1942) Pleistocene chronology. Proceedings of the Geologists' Association, 53, 1–45.
- Burchell, J.P.T. (1931) Early Neanthropic Man and his relation to the Ice Age. *Proceedings* of the Prehistoric Society of East Anglia, 6, 253–303.
- Burchell, J.P.T. (1933) The Northfleet 50-foot submergence later than the coombe rock of the post-Early Mousterian times. Archaeologia, 83, 67–91.
- Burchell, J.P.T. (1934a) The Middle Mousterian culture and its relation to the coombe rock of post-early Mousterian times. *Antiquaries Journal*, 14, 33–9.
- Burchell, J.P.T. (1934b) Fresh facts relating to the Boyn Hill Terrace of the Lower Thames valley. *Antiquaries Journal*, 14, 163–6.
- Burchell, J.P.T. (1935a) Evidence of a further glacial episode within the valley of the Lower Thames. *Geological Magazine*, **72**, 90–1.
- Burchell, J.P.T. (1935b) Some Pleistocene deposits at Kirmington and Crayford. *Geological Magazine*, 72, 327–31.
- Burchell, J.P.T. (1936a) A final note on the Ebbsfleet Channel series. *Geological Mag*azine, 73, 550–4.
- Burchell, J.P.T. (1936b) Hand-axes later than the Main Coombe Rock of the Lower Thames valley. *Antiquaries Journal*, **16**, 260–4.
- Burchell, J.P.T. (1936c) Evidence of a Late Glacial episode within the valley of the Lower Thames. *Geological Magazine*, **73**, 91–2.
- Burchell, J.P.T. (1954) Loessic deposits in the fifty-foot terrace post-dating the Main Coombe Rock of Baker's Hole, Northfleet, Kent. *Proceedings of the Geologists' Association*, **65**, 256–61.

- Burchell, J.P.T. (1957) A temperate bed of the last interglacial period at Northfleet, Kent. *Geological Magazine*, 94, 212–14.
- Callaway, C. (1905) The occurrence of glacial clay on the Cotteswold Plateau. *Geological Magazine*, 2, 216–9.
- Cambridge, P.G. (1977) Whatever happened to the Boytonian? A review of the marine Plio-Pleistocene of the southern North Sea Basin. *Bulletin of the Geological Society of Norfolk*, 29, 23-45.
- Campbell, S. and Bowen, D.Q. (1989) *Quaternary of Wales*, Geological Conservation Review Series, Nature Conservancy Council, 240 pp.
- Carreck, J.N. (1972) Chronology of the Quaternary deposits of south-east England, with special reference to their vertebrate faunas. Unpublished M.Phil. thesis, University of London.
- Carreck, J.N. (1976) Pleistocene mammalian and molluscan remains from 'Taplow' Terrace deposits at West Thurrock, near Grays, Essex. *Proceedings of the Geologists' Association*, 87, 83–92.
- Case, H.J. and Kirk, J.R. (1952) Notes and news: Henley-on-Thames. Oxoniensia, 15, 107.
- Case, H.J. and Kirk, J.R. (1955) Notes and news: Rotherfield Peppard. Oxoniensia, 19, 118.
- Castell, C.P. (1964) The non-marine Mollusca. In The Swanscombe Skull: a Survey of Research on a Pleistocene Site, (ed. C.D. Ovey), Royal Anthropological Institute of London, pp. 77–83.
- Catt, J.A. (1977) Loess and coversands. In *British Quaternary Studies: Recent Advances* (ed. F.W. Shotton), Clarendon Press, Oxford, pp. 221–9.
- Catt, J.A. (1978) The contribution of loess to soils in lowland Britain. In *The Effect of Man* on the Landscape: the Lowland Zone (eds S. Imbrey and J.G. Evans), Council for British Archaeological Resources, Report No. 21, pp. 12–20.
- Catt, J.A. (1979) Soils and Quaternary geology in Britain. *Journal of Soil Science*, **30**, 607–42.
- Catt, J.A. and Hodgson, J.M. (1976) Soils and geomorphology of the chalk in south-east England. *Earth Surface Processes*, **1**, 181–93.
- Catt, J.A., Corbett, W.M., Hodge, C.A.H., et al. (1971) Soils of north Norfolk. *Journal of Soil Science*, 22, 444–52.
- Catt, J.A., Weir, R.A. and Madgett, P.A. (1974) The loess of eastern Yorkshire and Lincoln-

shire. Proceedings of the Yorkshire Geological Society, 40, 23–34.

- Cepek, A.G. (1986) Quaternary stratigraphy of the German Democratic Republic. *Quaternary Science Reviews*, **5**, 359–64.
- Cepek, A.G. and Erd, K. (1982) Classification and stratigraphy of the Holsteinian and Saalian complex in the Quaternary of the German Democratic Republic. In *Quaternary Glaciations in the Northern Hemisphere* (eds D.J. Easterbrook, P. Hansliêk, K-D. Jäger and F. W. Shotton), UNESCO – International Geological Correlation Programme, Project 73/1/24 Report 7, Prague 1981, pp. 50–7.
- Chandler, R.H. (1914) The Pleistocene deposits of Crayford. *Proceedings of the Geologists' Association*, 25, 61–70.
- Chandler, R.H. (1916) The implements and cores of Crayford. *Proceedings of the Prebistoric Society of East Anglia*, 2, 240–8.
- Chandler, R.H. (1930) On the Clactonian Industry at Swanscombe. *Proceedings of the Prehistoric Society of East Anglia*, 6, 79–116.
- Chandler, R.H. (1931) On the Clactonian Industry and report of field meeting at Swanscombe. *Proceedings of the Geologists' Association*, 42, 175–7.
- Chandler, R.H. (1932a) Notes on types of Clactonian implements at Swanscombe. Proceedings of the Prehistoric Society of East Anglia, 6, 377–8.
- Chandler, R.H. (1932b) The Clactonian industry and report of field meeting at Swanscombe (II), *Proceedings of the Geologists' Association*, 43, 70–2.
- Chandler, R.H. and Leach, A.L. (1907) Excursion to Crayford and Dartford Heath. *Proceedings* of the Geologists' Association, 20, 122–6.
- Chandler, R.H. and Leach, A.L. (1911) Excursion to Dartford Heath. *Proceedings of the Geologists' Association*, 22, 171–5.
- Chandler, R.H. and Leach, A.L. (1912) On the Dartford Heath Gravel and on a Palaeolithic implement factory. *Proceedings of the Geologists' Association*, 23, 102–11.
- Chartres, C.J. (1975) Soil development on the terraces of the River Kennet. Unpublished Ph.D. thesis, University of Reading.
- Chartres, C.J. (1980), A Quaternary soil sequence in the Kennet valley, central southern England. *Geoderma*, 23, 125–146.
- Chartres, C.J. (1981) The mineralogy of Quaternary deposits in the Kennet valley,

Berkshire. *Proceedings of the Geologists'* Association, 92, 93–103.

- Chartres, C.J. (1984) The micromorphology of Quaternary river terrace deposits in the Kennet valley, Berkshire, England. *Earth Surface Processes and Landforms*, 9, 343–55.
- Chartres, C.J., Cheetham, G.H. and Fenwick, I.M. (1976) Excursion to the Kennet valley. In *Field Guide to the Oxford Region* (ed. D. Roe), Quaternary Research Association, Oxford, pp. 23–31.
- Chatwin C.P. (1927) Fossils from the ironsands on Netley Heath (Surrey), Summary of Progress, Geological Survey of Great Britain [for 1926], pp. 154–7.
- Cheetham, G.H. (1980) Late Quaternary palaeohydrology: the Kennet valley case study. In *The Shaping of Southern England* (ed. D.K.C. Jones), Institute of British Geographers Special Publication 11, Academic Press, London, pp. 203–23.
- Cheshire, D.A. (1978) The Glaciation of the Lea valley between Hertford and Enfield. Unpublished M.Sc. thesis, City of London Polytechnic and Polytechnic of North London.
- Cheshire, D.A. (1981) A contribution towards a glacial stratigraphy of the lower Lea valley, and implications for the Anglian Thames. *Quaternary Studies*, **1**, 27–69.
- Cheshire, D.A. (1983a) Till lithology in Hertfordshire and west Essex. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 50–9.
- Cheshire, D.A. (1983b) Westmill. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 120–32.
- Cheshire, D.A. (1983c) Hoddesdon, St Albans Sand and Gravel Co. Quarry and Hoddesdon, Nursery Grove Pits. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 140–8.
- Cheshire, D.A. (1986a) The lithology and stratigraphy of the Anglian deposits of the Lea Basin. Unpublished Ph.D. thesis, Hatfield Polytechnic.
- Cheshire, D.A. (1986b) The use of small clast counts as a means of till differentiation in Hertfordshire and western Essex. In *Clast Lithological Analysis* (ed. D.R. Bridgland), Technical Guide 3, Quaternary Research Association, Cambridge, 129–43.

- Cheshire, D.A. and Gibbard, P.L. (1983) Harper Lane. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, 102–9.
- Clark, W.E.LeG. (1955) The Fossil Evidence for Human Evolution. Chicago University Press.
- Clarke, M.R. and Dixon, A.J. (1981) The Pleistocene braided river deposits in the Blackwater
- area of Berkshire and Hampshire, England. Proceedings of the Geologists' Association, 92, 139–57.
- Clayton, K.M. (1957) Some aspects of the glacial deposits of Essex. *Proceedings of the Geologists' Association*, 68, 1–19.
- Clayton, K.M. (1960) The landforms of parts of southern Essex. *Transactions of the Institute* of British Geographers, **28**, 55–74.
- Clayton, K.M. (1964) The glacial geomorphology of southern Essex. In *Guide to London Excursions* (ed. K.M. Clayton), International Geographical Congress [London 1964], **20**, 123–8.
- Clayton, K.M. (1977) River terraces. In *British Quaternary Studies: Recent Advances* (ed. F.W. Shotton), Clarendon Press, Oxford, pp. 153–68.
- Clayton, K.M. and Brown, J.C. (1958) The glacial deposits around Hertford. *Proceedings of the Geologists' Association*, 69, 103–19
- Clinch, G. (1908) Early Man. In *The Victoria History of the County of Kent* (ed. W. Page), Vol. 1, Archibald Constable Ltd., Westminster, pp. 307–38.
- Coles, R. (1934) The evolution of the coastal drainage of Essex. *Essex Naturalist*, 25, 36–49 and 65–70.
- Collins, D. (1969) Culture, traditions and environment of early Man. *Current Anthropologist*, **10**, 267–316.
- 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.W. (1970a) Geological investigation of Boyn Hill Terrace deposits at Barnfield Pit, Swanscombe, Kent, during 1969. *Proceedings of the Royal Anthropological Institute* [for 1969], 90–3.
- Conway, B.W. (1970b) Written discussions on R.G. West 1969. Pollen analyses from interglacial deposits at Aveley and Grays, Essex. *Proceedings of the Geologists' Association*, **81**, 177–9.

- Conway, B.W. (1971) Geological investigation of Boyn Hill Terrace deposits at Barnfield Pit, Swanscombe, Kent during 1970. Proceedings of the Royal Anthropological Institute [for 1970], 60–4.
- Conway, B.W. (1972) Geological investigation of Boyn Hill Terrace deposits at Barnfield Pit, Swanscombe, Kent during 1971. Proceedings of the Royal Anthropological Institute [for 1971], 80–5.
- Conway, B.W. (1985) Research history and geology of Barnfield Pit. In *The Story of Swanscombe Man* (ed. K.L. Duff), Kent County Council and Nature Conservancy Council, pp. 6–13.
- Conway B.W. and Waechter, J. d'A. (1977) Lower Thames and Medway valleys – Barnfield Pit, Swanscombe. In *South East England and the Thames Valley* (eds E.R. Shephard-Thorn and J.J. Wymer), Guide Book for Excursion A5, X INQUA Congress, Birmingham, Geoabstracts, Norwich, pp. 38–44.
- Cook, J., Stringer, C.B., Currant, A.P., *et al.* (1982) A review of the chronology of the European Middle Pleistocene hominid record. *Yearbook of Physical Anthropology*, **25**, 19–65.
- Coope, G.R. (1968) An insect fauna from the Mid-Weichselian deposits at Brandon, Warwickshire. *Philosophical Transactions of the Royal Society of London*, **B254**, 425–56.
- Coope, G.R. (1987) The response of late Quaternary insect communities to sudden climatic changes. In *Organisation of Communities, Past and Present* (eds J.H.R. Gee and P.S. Giller), Blackwell Scientific, Oxford, pp. 421–38.
- Coope, G.R. and Angus, R.B. (1975) An ecological study of a temperate interlude in the middle of the last glaciation, based on fossil Coleoptera from Isleworth, Middlesex. *Journal of Animal Ecology*, 44, 365–91.
- Coope, G.R., Shotton, F.W. and Strachan, I. (1961) A Late Pleistocene fauna and flora from Upton Warren, Worcestershire. *Philo*sophical Transactions of the Royal Society of London, B244, 379–421.
- Cooper, J. (1972) Last interglacial (Ipswichian) non-marine Mollusca from Aveley, Essex. *Essex Naturalist*, **33**, 9–14.
- Cornwall, I.W. (1950) Pleistocene and Holocene sections in deposits of the Lower Thames. University of London Institute of Archaeology, 6th Annual Report, 34–43.

Cornwall, I.W. (1958) Soils for the Archaeologist, Phoenix House, London. 230 pp.

- Cotton, R.P. (1847) On the Pliocene deposits of the valley of the Thames at Ilford. Annals and Magazine of Natural History, Series 1, 20, 164–9.
- Cranshaw, S. (1983) Handaxes and cleavers: selected English Acheulian industries. *British Archaeological Report, British Series*, 113, 283 pp.
- Currant, A.P. (1986) Man and Quaternary interglacial faunas in Britain. In *The Palaeolithic* of Britain and its Nearest Neighbours; Recent Trends (ed. S.N. Collcutt), J.R. Collis Publications, Department of Archaeology and Prehistory, Sheffield University, pp. 50–2.
- Currant, A.P. (1989) The Quaternary origins of the modern British mammal fauna. *Biological Journal of the Linnean Society*, 38, 23-30.
- Curry, D., Adams, C.G., Boulter, M.C., *et al.* (1978) *A Correlation of Tertiary Rocks in the British Isles*, Special Report of the Geological Society of London, No. 12, 72 pp.
- Dalrymple, J.B. (1958) The application of soil micromorphology to fossil soils and other deposits from archaeological sites. *Journal of Soil Science*, 9, 199–209.
- Dalton, W.H. (1880) *The Geology of the Neighbourhood of Colchester*. Memoir of the Geological Survey of Great Britain, 24 pp.
- Dalton, W.H. (1890) Note on the Upminster brickyard. *Essex Naturalist*, 4, 186-7.
- Dalton, W.H. (1908) Post-glacial beds in Mersea, Essex. Essex Naturalist, 15, 136–7.
- Davies, G.M. (1915) The rocks and minerals of the Croydon Regional Survey area. Proceedings and Transactions of the Croydon Natural History and Scientific Society, 8, 53–96.
- Davies, G.M. (1917) Excursion to Netley Heath, Newlands Corner and the Silent Pool. *Proceedings of the Geologists' Association*, 28, 48–51.
- Davis, A.G. (1953) On the geological history of some of our snails illustrated by some Pleistocene and Holocene deposits in Kent and Surrey. *Journal of Conchology*, 23, 355–64.
- Davis, W.M. (1895) The development of certain English rivers. *Geographical Journal*, 5, 127–46.
- Davis, W.M. (1899) The drainage of cuestas. Proceedings of the Geologists' Association,

16, 87-93.

- Davis, W.M. (1909) The valleys of the Cotswold Hills. Proceedings of the Geologists' Association, 21, 150–2.
- Dawkins, W.B. (1867) On the age of the lower brickearth of the Thames valley. *Quarterly Journal of the Geological Society of London*, 23, 91–109.
- Dawkins, W.B. (1868) On a new species of fossil deer from Clacton. Quarterly Journal of the Geological Society of London, 24, 511–13.
- Dawkins, W.B. (1869) On the distribution of the British post-glacial mammals. *Quarterly Jour*nal of the Geological Society of London, 25, 192–217.
- Day, M.H. (1977) Guide to Fossil Man: A Handbook of Human Palaeontology, 3rd edn, Cassell, London, 346 pp.
- Devoy, R.J.N. (1977) Flandrian sea level changes in the Thames estuary and the implications for land subsidence in England and Wales. *Nature, London*, **270**, 712–15.
- Devoy, R.J.N. (1979) Flandrian sea level changes and vegetational history of the Lower Thames estuary. *Philosophical Transactions of the Royal Society of London*, **B285**, 355–407.
- Dewey, H. (1919) On some Palaeolithic flake implements from the high level terraces of the Thames valley. *Geological Magazine*, 6, 49–57.
- Dewey, H. (1930) Palaeolithic Thames deposits. Proceedings of the Prehistoric Society of East Anglia, 6, 147–155.
- Dewey, H. (1932) The Palaeolithic deposits of the Lower Thames valley. Quarterly Journal of the Geological Society of London, 88, 35–56.
- Dewey, H. (1934) The excursion to the 100-foot terrace of the Thames at Swanscombe, Kent (4th August), *International Congress of Prebistoric and Protobistoric Science* (London), 70–2.
- Dewey, H. (1959) Palaeolithic deposits of the Thames at Dartford Heath and Swanscombe, north Kent. Unpublished, edited text of Henry Stopes memorial lecture, Geologists' Association, 1959.
- Dewey, H. and Bromehead, C.E.N. (1915) *The Geology of the Country around Windsor and Chertsey*. Memoir of the Geological Survey of Great Britain, 123 pp.
- Dewey, H. and Bromehead, C.E.N. (1921) *The Geology of South London*. Memoir of the Geological Survey of Great Britain, 92 pp.

- Dewey, H. and Smith, R.A. (1914) The Palaeolithic sequence at Swanscombe, Kent. Proceedings of the Geologists' Association, 25, 90-7.
- Dewey, H., Bromehead, C.E.N., Chatwin, C.P., et al. (1924) The Geology of the Country around Dartford, Memoir of the Geological Survey of Great Britain, 136 pp.
- Dibley, G.E. and Kennard, A.S. (1916) Excursion to Grays. Proceedings of the Geologists' Association, 27, 103–5.
- Diebel, K. and Wolfschläger, H. (1975) Ostracoden aus dem junpleistozänen Travertin von Ehringsdorf bei Weimar. Abhandlungen des Zentralen Geologischen Instituts [Berlin], 23, 91–136.
- Dines, H.G. (1928) On the glaciation of the north Cotteswold area. Summary of Progress, Geological Survey of Great Britain [for 1927], pp. 66–71.
- Dines, H.G. (1946) Pleistocene and recent deposits. In *The Geology of the Country* around Witney (eds L.S. Richardson, W.J. Arkell and H.G. Dines), Memoir of the Geological Survey of Great Britain, 105–29.
- Dines, H.G. and Chatwin, C.P. (1930) Pliocene sandstone from Rothamstead (Hertfordshire), Summary of Progress, Geological Survey of Great Britain [for 1929], pp. 1–7.
- Dines, H.G. and Edmunds, F.H. (1925) The Geology of the Country around Romford, Memoir of the Geological Survey of Great Britain, 53 pp.
- Dines, H.G. and Edmunds, F.H. (1929) The Geology of the Country around Aldersbot and Guildford, Memoir of the Geological Survey of Great Britain, 182 pp.
- Dines, H.G., King, W.B.R. and Oakley, K.P. (1938) A general account of the 100 ft terrace gravels of the Barnfield Pit, Swanscombe. *Journal of the Royal Anthropological Institute*, 68, 21–7.
- Docherty, J. (1967) The exhumed sub-Tertiary surface in north-west Kent. South East Naturalist, 70, 19–31.
- Docherty, J. (1971) Chalk karst: a synthesis of C.C. Faggs' theories of chalkland morphology in the light of recent hydrological research. *Proceedings of the Croydon Natural History and Scientific Society*, **15**, 21–34.
- D'Olier, B. (1975) Some aspects of late Pleistocene-Holocene drainage of the River Thames in the eastern part of the London Basin. *Philosophical Transactions of the Royal*

Society of London, A279, 269-77.

- Duff, K.L. (1985) (ed.) *The Story of Swanscombe Man*, Kent County Council and Nature Conservancy Council, 40 pp.
- Duigan, S.L. (1955) Plant remains from the gravels of the Summertown-Radley Terrace near Dorchester, Oxfordshire. *Quarterly Journal of the Geological Society of London*, 111, 225–38.
- Duigan, S.L. (1956) Interglacial plant remains from the Wolvercote channel, Oxford. Quarterly Journal of the Geological Society of London, 112, 363–72.
- Duphörn, K., Grube, F., Meyer, K.D., et al. (1973) Pleistocene and Holocene. Eiszeitalter und Gegenwart, 23/24, 222-50.
- Eden, D.N. (1980) The loess of north-east Essex, England. *Boreas*, 9, 165-77.
- Ehlers, J. (1981) Problems of the Saalian stratigraphy in the Hamburg area. *Mededelingen Rijks Geologische Dienst*, **34**, 26–9.
- Ellis, T.S. (1882) On some features in the formation of the Severn valley as seen near Gloucester. *Transactions of the School of Science Philosophical Society, Gloucester* [for 1882], pp. 3–15.
- Emiliani, C. (1955) Pleistocene temperatures. Journal of Geology, 63, 538–78.
- Emiliani, C. (1957) Temperature and age analysis of deep-sea cores. *Science, New York*, 125, 383–7.
- Evans, J. (1860) On the occurrence of flint implements in undisturbed beds of gravel, sand and clay. *Archaeologia*, **38**, 280–307.
- Evans, J. (1872) The Ancient Stone Implements, Weapons and Ornaments of Great Britain, 1st edn, Longmans, Green and Co., London, 640 pp.
- Evans, J. (1897) The Ancient Stone Implements, Weapons and Ornaments of Great Britain, 2nd edn, Longmans, Green, and Co, London, 747 pp.
- Evans, P. (1954) Field meeting in the Vale of St Albans. *Proceedings of the Geologists' Association*, **65**, 18–22.
- Evans, P. (1971) Towards a Pleistocene timescale. Part 2 of *The Phanerozoic Time-scale –* A Supplement, Special Publication of the Geological Society of London, No. 5, pp. 123–356.
- Falconer, H. (1868) Palaeontological Memoirs and Notes, Compiled and Edited by Charles Murchison, Vol. 2, R. Hardwicke, London, 675 pp.

396

- Federoff, N. (1971) Caractères micromorphologiques des pédogénèses quaternaire en France. Bulletin de l'Association Française pour l'Étude du Quaternaire, Supplément, 4, 341-9.
- Fisher, O. (1868a) A few notes on Clacton, Essex. *Geological Magazine*, 5, 213–5.
- Fisher, O. (1868b) The boulder clay at Witham and the Thames valley. *Geological Magazine*, **5**, 98–100.
- Fisher, P.F. (1982) A study of the plateau gravels in the western part of the London Basin. Unpublished Ph.D. thesis, Kingston Polytechnic, 2 volumes.
- Franks, J.W. (1960) Interglacial deposits at Trafalgar Square, London. *New Phytologist*, 59, 145–52.
- Franks, J.W., Sutcliffe, A.J., Kerney, M.P., et al. (1958) Haunt of the elephant and rhinoceros: the Trafalgar Square of 100,000 years ago – new discoveries. *Illustrated London News*, 14th June, Vol. 232, pp. 1011–3.
- French, H.H. (1888) Excursion to Gomshall, Netley Heath, and Clandon. *Proceedings of the Geologists' Association*, **10**, 182–6.
- French, J. (1891) On the occurrence of Westleton Beds in part of north-western Essex. *Essex Naturalist*, 5, 210–18.
- Friedman, G.M. (1967) Dynamic processes and statistical parameters compared for size frequency distribution of beach and river sands. *Journal of Sedimentary Petrology*, 37, 327–54.
- Gascoyne, M., Currant, A.P. and Lord, T.C. (1981) Ipswichian fauna of Victoria Cave and the marine palaeoclimatic record. *Nature*, *London*, **294**, 652–4.
- Geikie, A. and Reid, C. (1866) The Pliocene deposits of north-western Europe. *Nature*, *London*, 34, 341–3.
- Gibbard, P.L. (1974) Pleistocene stratigraphy and vegetational history of Hertfordshire. Unpublished Ph.D. thesis, University of Cambridge.
- Gibbard, P.L. (1977) Pleistocene history of the Vale of St Albans. *Philosophical Transactions* of the Royal Society of London, **B280**, 445-83.
- Gibbard, P.L. (1978a) Quaternary geology and landform development in the Vale of St Albans. In *Field Guide to the Vale of St Albans* (eds J. Rose and P.L. Gibbard), Quaternary Research Association, London, pp. 9–29.

- Gibbard, P.L. (1978b) Westmill. In *Field Guide* to the Vale of St Albans (eds J. Rose and P.L. Gibbard), Quaternary Research Association, London, pp. 63–7.
- Gibbard, P.L. (1978c) Hatfield Polytechnic. In *Field Guide to the Vale of St Albans* (eds J. Rose and P.L. Gibbard), Quaternary Research Association, London, pp. 79–85.
- Gibbard, P.L. (1978d) Moor Mill. In *Field Guide* to the Vale of St Albans (eds J. Rose and P.L. Gibbard), Quaternary Research Association, London, pp. 87–90.
- Gibbard, P.L. (1979) Middle Pleistocene drainage in the Thames valley. *Geological Magazine*, **116**, 35–44.
- Gibbard, P.L. (1982) Terrace stratigraphy and drainage history of the plateau gravels of north Surrey, south Berkshire, and north Hampshire, England. *Proceedings of the Geologists' Association*, 93, 369–84.
- Gibbard, P.L. (1983) The diversion of the Thames – a review. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 8–23.
- Gibbard,P.L. (1985) *The Pleistocene History of the Middle Thames Valley*, Cambridge University Press, 155 pp.
- Gibbard, P.L. (1986) Comparison of the clast lithological composition of the gravels in the middle Thames using canonical variates analysis and principal components analysis. In *Clast Lithological Analysis* (ed. D.R. Bridgland), Technical Guide No. 3, Quaternary Research Association, Cambridge, pp. 153–64.
- Gibbard, P.L. (1988a) The history of the great northwest European rivers during the past three million years. *Philosophical Transactions of the Royal Society of London*, **B318**, 559–602.
- Gibbard, P.L. (1988b) Palynological problems and the vegetational sequence of the Pliocene-preglacial Pleistocene of East Anglia. In *Pliocene-Middle Pleistocene of East Anglia* (eds P.L. Gibbard and J.A. Zalasiewicz), Field Guide, Quaternary Research Association, Cambridge, pp. 42–9.
- Gibbard, P.L. (1989) The geomorphology of a part of the Middle Thames forty years on: a reappraisal of the work of F. Kenneth Hare. *Proceedings of the Geologists' Association*, **100**, 481–503.
- Gibbard, P.L. and Cheshire, D.A. (1983) Hatfield

Polytechnic (Roe Hyde Pit), In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 110–9.

- Gibbard, P.L. and Peglar, S.M. (1990) Palynology of the interglacial deposits at Little Oakley, Essex, and their correlation. *Philosophical Transactions of the Royal Society of London*, **B328**, 341–57.
- Gibbard, P.L. and Wymer, J.J. (1983) HighlandsFarm. In *Diversion of the Thames* (ed. J. Rose) Field Guide, Quaternary Research Association, Cambridge, pp. 69–76.
- Gibbard, P.L. and Pettit, M. (1978) The palaeobotany of the interglacial deposits at Sugworth, Berkshire. *New Phytologist*, 81, 465-77.
- Gibbard, P.L. and Stuart, A.J. (1974) Trace fossils from pro-glacial lake sediments. *Boreas*, 3, 69–74.
- Gibbard, P.L., Coope, G.R., Hall, A.R., et al. (1982) Middle Devensian river deposits beneath the 'Upper Floodplain' terrace of the River Thames at Kempton Park, Sunbury, Surrey, England. Proceedings of the Geologists' Association, 93, 275–90.
- Gibbard, P.L., Wintle, A.G. and Catt, J.A. (1987) Age and origin of clayey silt 'brickearth' in West London, England. *Journal of Quaternary Science*, **2**, 3–9.
- Gibbard, P.L., Whiteman, C.A. and Bridgland, D.R. (1988) A preliminary report on the stratigraphy of the Lower Thames valley. *Quaternary Newsletter*, 56, 1–8.
- Gibbard, P.L., West, R.G., Zagwijn, W.H., *et al.* (1991) Early and early Middle Pleistocene correlations in the southern North Sea Basin. *Quaternary Science Reviews*, **10**, 23–52.
- Gilbert, C.J. (1919a) On the occurrence of the extensive deposits of high-level sands and gravels resting upon the chalk at Little Heath, near Berkhampstead. *Quarterly Journal of the Geological Society of London*, **75**, 32–43.
- Gilbert, C.J. (1919b) Excursion to Berkhamstead and Little Heath. *Proceedings of the Geologists' Association*, **30**, 87–91.
- Gilbertson, D.D. (1976) Non-marine molluscan faunas of terrace gravels in the Upper Thames Basin. In *Field Guide to the Oxford Region* (ed. D.A. Roe), Quaternary Research Association, Oxford, pp. 16–9.
- Gilbertson, D.D. (1980) The palaeoecology of the Middle Pleistocene Mollusca from Sugworth, Oxfordshire. *Philosophical Transac*-

tions of the Royal Society of London, B289, 107–18.

- Gladfelter, B.G. (1972) Cold-climate features in the vicinity of Clacton-on-Sea, Essex (England), *Quaternaria*, 16, 121–35.
- Gladfelter, B.G. (1975) Middle Pleistocene sedimentary sequences in East Anglia (UK), In *After the Australopithecines: Stratigraphy, Ecology and Culture Change in the Middle Pleistocene* (eds K.W. Butzer and G.L. Isaac), Mouton, The Hague, pp. 225–58.
- Gladfelter, B.G. and Singer, R. (1975) Implications of East Anglian glacial stratigraphy for the British Lower Palaeolithic. *In* Quaternary Studies (eds R.P. Suggate and M.M. Cresswell), Selected papers from IX INQUA Congress, Christchurch, New Zealand, 2–10 December 1973. *Bulletin of the Royal Society of New Zealand*, 13, 139–45.
- Goudie, A.S. (1976) The Oxford region. In *Field Guide to the Oxford Region* (ed. D.A. Roe), Quaternary Research Association, Oxford, pp. 1–5.
- Goudie, A.S. and Hart, M.G. (1975) Pleistocene events and forms in the Oxford region. In *Oxford and its Region* (eds C.G. Smith and D.I. Scargill), Oxford University Press, pp. 3–13.
- Gray, J.W. (1911) The north and mid Cotteswolds and the Vale of Moreton during the Glacial Epoch. *Proceedings of the Cotteswolds Naturalists Field Club*, **17**, 257–74.
- Green, A.H. (1864) The Geology of Banbury, Woodstock, Bicester and Buckingham, Memoir of the Geological Survey of Great Britain, 62 pp.
- Green, C.P. and McGregor, D.F.M. (1978a) Pleistocene gravel trains of the River Thames. *Proceedings of the Geologists' Association*, **89**, 143–56.
- Green, C.P. and McGregor, D.F.M. (1978b) Pleistocene gravel deposits of the Vale of St Albans and the Middle Thames. In *Field Guide to the Vale of St Albans* (eds J. Rose and P.L. Gibbard), Quaternary Research Association, London, pp. 31–7.
- Green, C.P. and McGregor, D.F.M. (1978c) Westwood. In *Field Guide to the Vale of St Albans* (eds J. Rose and P.L. Gibbard), Quaternary Research Association, London, p. 91.
- Green, C.P. and McGregor, D.F.M. (1980) Quaternary evolution of the River Thames. In *The Shaping of Southern England* (ed. D.K.C. Jones), Institute of British Geographers

Special Publication 11, Academic Press, London, pp. 177–202.

- Green, C.P. and McGregor, D.F.M. (1983) Lithology of the Thames gravels. In *Diversion* of the Thames (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 24–8.
- Green, C.P. and McGregor, D.F.M. (1986) The utility of intercomponent ratios in the interpretation of stone count data. In *Clast Lithological Analysis* (ed. D.R. Bridgland), Technical Guide No.3, Quaternary Research Association, Cambridge, pp. 83–93.
- Green, C.P. and McGregor, D.F.M. (1987) River terraces: a stratigraphic record of environmental change. In *International Geomorphology 1986 Part 1* (ed. V. Gardiner), Wiley, Chichester, pp. 977–87.
- Green, C.P., Hey, R.W. and McGregor, D.F.M. (1980) Volcanic pebbles in Pleistocene gravels of the Thames in Buckinghamshire and Hertfordshire. *Geological Magazine*, **117**, 59–64.
- Green, C.P., McGregor, D.F.M. and Evans, A. (1982) Development of the Thames drainage system in Early and Middle Pleistocene times. *Geological Magazine*, **119**, 281–90.
- Green, C.P., Coope, G.R., Currant, A.P., *et al.*, (1984) Evidence for two temperate episodes in late Pleistocene deposits at Marsworth, Buckinghamshire. *Nature*, *London*, **309**, 778–81.
- Green, H.S. (1984) Pontnewydd Cave. A Lower Palaeolithic Hominid Site in Wales: the First Report, National Museum of Wales, Cardiff, 227 pp.
- Greensmith, J.T. and Tucker, E.V. (1980) Evidence for differential subsidence on the Essex coast. *Proceedings of the Geologists' Association*, **91**, 169–75.
- Gregory, J.W. (1894) Evolution of the Thames. *Natural Science*, **5**, 97–108.
- Gregory, J.W. (1922) Evolution of the Essex Rivers and of the Lower Thames, Benham, Colchester, 64 pp.
- Grube, F., Christensen, S. and Vollmer, T. (1986) Glaciations in north west Germany. *Quaternary Science Reviews*, **5**, 347–57.
- Gruhn, R., Bryan, A.L. and Moss, A.J. (1974) A contribution to Pleistocene chronology in south east Essex, England. *Quaternary Research*, 4, 53–71.
- Grün, R., Schwarcz, H.P. and Chadwin, J. (1988) ESR dating of tooth enamel: coupled cor-

rection for U-uptake and U-series disequilibrium. *Nuclear Tracks and Radiation Measures*, 14, 237–41.

- Harding, P. and Gibbard, P.L. (1984) Excavations at Northwold Road, Stoke Newington, north east London, 1981. *Transactions of the Middlesex Archaeological Society*, 34, 1–18.
- Harding, P., Bridgland, D.R., Madgett, P.A. et al. (1991) Recent investigations of Pleistocene sediments near Maidenhead, Berkshire, and their archaeological content. Proceedings of the Geologists' Association, 102, 25–53.
- Hare, F.K. (1947) The geomorphology of a part of the Middle Thames. *Proceedings of the Geologists' Association*, **58**, 294–339.
- Harmer, F.W. (1902) A sketch of the later Tertiary history of East Anglia. *Proceedings of the Geologists' Association*, **17**, 416–79.
- Harmer, F.W. (1907) On the origin of certain cañon-like valleys associated with lake-like areas of depression. *Quarterly Journal of the Geological Society of London*, 63, 470–514.
- Harries, W.J.R. (1977) *The Sand and Gravel Resources of the Country around Eynsham, Oxfordsbire.* Mineral Assessment Report of the Institute of Geological Sciences 28, 88 pp.
- Hart, J. McA. (1960), Field meeting at Grays Thurrock. *Proceedings of the Geologists' Association*, **71**, 242–4.
- Hawkins, H.L. (1922) The relation of the River Thames to the London Basin. *Report of the British Association for the Advancement of Science* [for 1922], 365–6.
- Hawkins, H.L (1928) Excursion to Kingsclere. Proceedings of the Geological Society of London, 39, 98–102.
- Hedberg, H.D. (1976) International Stratigraphic Guide. Wiley, New York, 200 pp.
- Hey, R.W. (1965) Highly quartzose pebble gravels in the London Basin. *Proceedings of the Geologists' Association*, **76**, 403–20.
- Hey, R.W. (1967) The Westleton Beds reconsidered. *Proceedings of the Geologists' Association*, **78**, 427–45.
- Hey, R.W. (1976a) The terraces of the Middle and Lower Thames. *Studia Societatis Scientiarum Torunensis*. Torun-Polonia, **8C**, 115–22.
- Hey, R.W. (1976b) Provenance of far-travelled pebbles in the pre-Anglian Pleistocene of East Anglia. *Proceedings of the Geologists' Association*, **87**, 69–82.
- Hey, R.W. (1980) Equivalents of the Westland

Green Gravels in Essex and East Anglia. Proceedings of the Geologists' Association, 91, 279–90.

- Hey, R.W. (1982) Composition of Pre-Anglian gravels in Norfolk. *Bulletin of the Geological Society of Norfolk*, **32**, 51–9.
- Hey, R.W. (1983) Ferneux Pelham. In *Diversion* of the Thames (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 94–5.
- Hey, R.W. (1986) A re-examination of the Northern Drift of Oxfordshire. *Proceedings* of the Geologists' Association, 97, 291–302.
- Hey, R.W. and Auton, C.A. (1988) Compositions of pebble-beds in the Neogene and pre-Anglian Pleistocene of East Anglia. In *Pliocene-Middle Pleistocene of East Anglia* (eds P.L. Gibbard and J.A. Zalasiewicz), Field Guide, Quaternary Research Association, Cambridge, pp. 35–41.
- Hey, R.W. and Brenchley, P.J. (1977) Volcanic pebbles from Pleistocene gravels in Norfolk and Essex. *Geological Magazine*, **114**, 219–25.
- Hey, R.W., Krinsley, D.H. and Hyde, P.J.W. (1971) Surface textures of sand grains from the Hertfordshire pebble gravels. *Geological Magazine*, **108**, 377–82.
- Hiller, D. (1972) Untersuchungen zur Biologie und zur Ökologie limnischer Ostracoden aus der Umbebung von Hamburg. Archiv für Hydrobiologie, Supplementband 40 (Stuttgart), Heft 4, 400–97.
- Hinton, M.A.C. (1900a) The Pleistocene deposits of the Ilford and Wanstead district, Essex. *Essex Naturalist*, **11**, 161–5.
- Hinton, M.A.C. (1900b) The Pleistocene deposits of the Ilford and Wanstead district. *Proceedings of the Geologists' Association*, 16, 271–81.
- Hinton, M.A.C. (1901) Excursion to Grays Thurrock. Proceedings of the Geologists' Association, 17, 141–4.
- Hinton, M.A.C. (1910) A preliminary account of the British voles and lemmings; with some remarks on the Pleistocene climate and geography. *Proceedings of the Geologists' Association*, 21, 489–507.
- Hinton, M.A.C. (1911) The British fossil shrews. Geological Magazine, 8, 529–39.
- Hinton, M.A.C. (1923) Note on the rodent remains from Clacton-on-Sea. Quarterly Journal of the Geological Society of London, 79, 626.

- Hinton, M.A.C. (1926a) The Pleistocene mammalia of the British Isles and their bearing upon the date of the Glacial Period. *Proceedings of the Yorksbire Geological Society New Series*, **20**, 325–48.
- Hinton, M.A.C. (1926b) Monograph of the Voles and Lemmings (Microtinae), Living and Extinct, Volume 1 [Volume 2 not published], British Museum, London, 488 pp.
- Hinton, M.A.C. and Kennard, A.S. (1900) Contributions to the Pleistocene geology of the Thames valley, I. The Grays Thurrock area, part I. *Essex Naturalist*, **11**, 336–70.
- Hinton, M.A.C. and Kennard, A.S. (1905) The relative ages of the stone implements of the Lower Thames valley. *Proceedings of the Geologists' Association*, 19, 76–100.
- Hinton, M.A.C. and Kennard, A.S. (1907) Contributions to the Pleistocene geology of the Thames valley I. The Grays Thurrock area, Part II (Revised), *Essex Naturalist*, 15, 56–88.
- Holland, C.H., Audley-Charles, M.G., Bassett, M.G., et al. (1978) A Guide to Stratigraphic Procedure, Special Report for the Geological Society of London, No. 10, 18 pp.
- Hollin, J.T. (1971) Ice-sheet surges and interglacial sea levels. Unpublished Ph.D. thesis, Princeton University, 179 pp.
- Hollin, J.T. (1977) Thames interglacial sites, Ipswichian sea levels and Antarctic ice surges. *Boreas*, 6, 33–52.
- Hollyer, S.E. and Simmons, M.B. (1978) The Sand and Gravel Resources of the Country around Southend-on-Sea, Essex. Mineral Assessment Report of the Institute of Geological Sciences 36, 212 pp.
- Holman, J.A. (1987) Middle Pleistocene herpetological records from interglacial deposits at Sugworth near Oxford. British Herpetological Society Bulletin, 21, 5–7.
- Holman, J.A. and Clayden, J.D. (1988) Pleistocene interglacial herpetofauna from the Greenlands Pit, Purfleet, Essex. British Herpetological Society Bulletin, 26, 26–7.
- Holman, J.A., Stuart, A.J. and Clayden, J.D. (1990) A Middle Pleistocene herpetofauna from Cudmore Grove, Essex, England, and its paleogeographic and paleoclimatic implications. *Journal of Vertebrate Paleontology*, **10**, 86–94.
- Holmes, T.V. (1890) Some sections between West Thurrock and Stifford on the Grays and Upminster railway. *Essex Naturalist*, 4, 143–9.

- Holmes, T.V. (1892a) The new railway from Grays Thurrock to Romford: sections between Upminster and Romford. Quarterly Journal of the Geological Society of London, 48, 365–72.
- Holmes, T.V. (1892b) Excursion to the cuttings on the new railway between Upminster and Romford. *Proceedings of the Geologists' Association*, 12, 316–9.
- Holmes, T.V. (1892c) Recent excursions of the Geologists' Association in Essex. Upminster and Hornchurch. *Essex Naturalist*, 6, 96–7.
- Holmes, T.V. (1893) The new railway between Upminster and Romford. Boulder Clay beneath old river gravel at Hornchurch. Conclusions therefrom. *Essex Naturalist*, 7, 1–14.
- Holmes, T.V. (1894) Further notes on some sections of the new railway from Romford to Upminster, and on the relations of the Thames valley beds to the boulder clay. *Quarterly Journal of the Geological Society* of London, 50, 443–52.
- Holmes, T.V. (1896) Notes on the ancient physiography of south Essex. *Essex Naturalist*, 9, 193–200.
- Holyoak, D.T. (1983) A late Pleistocene interglacial flora and molluscan fauna from Thatcham, Berkshire, with notes on the Mollusca from the interglacial deposits at Aveley, Essex. *Geological Magazine*, **120**, 623–9.
- Hopson, P.M. (1981) The Sand and Gravel Resources of the Country around Stansted Mountfitchet, Essex, Mineral Assessment Report of the Institute of Geological Sciences, 104, 110 pp.
- Horton, A. (1977) Nettlebed. In South East England and the Thames Valley (eds E.R. Shephard-Thorn and J.J. Wymer), Guide Book for Excursion A5, X INQUA Congress, Birmingham, Geoabstracts, Norwich, pp. 16–8.
- Horton, A. (1983) Nettlebed. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 63–5.
- Howell, F.C. (1960) European and northwest African Middle Pleistocene hominids. *Current Anthropologist*, **1**, 195–232.
- Hubbard, R.N.L.B. (1972) An interim report of the pollen record at Swanscombe. *Proceedings of the Royal Anthropological Institute* [for 1971], p. 79.

- Hubbard, R.N.L.B. (1982) The environmental evidence from Swanscombe and its implications for Palaeolithic archaeology. In Archaeology in Kent to AD 1500 (ed. P.E. Leach), Council for British Archaeology, Research Report 48, pp. 3–7.
- Hughes, T.McK. (1868) On the two plains of Hertfordshire and their gravels. Quarterly Journal of the Geological Society of London, 24, 283–7.
- Hull, E. (1855) On the physical geography and Pleistocene phenomena of the Cotteswold Hills. Quarterly Journal of the Geological Society of London, 11, 475–96.
- Hull, E. (1859) *The Geology of the Country around Woodstock, Oxfordshire*, Memoir of the Geological Survey of Great Britain, 30 pp.
- Hull, E. and Whitaker, W. (1861) *The Geology of Parts of Oxfordshire and Berkshire*, Memoir of the Geological Survey of Great Britain, 57 pp.
- Hunt, C.O. (1985) Pollen from the Eynsham Gravel at Magdalen College, Oxford. *In* The chronology and environmental framework of Early Man in the Upper Thames Valley: a new model (eds D.J. Briggs, G.R. Coope and D.D. Gilbertson), *British Archaeological Report*, *British Series*, 137, 85–7.
- Janossy, D. (1975) Mid-Pleistocene microfauna of Continental Europe. In After the Australopithecines: Stratigraphy, Ecology and Culture Change in the Middle Pleistocene (eds K.W. Butzer and G.L. Isaac), Mouton, The Hague, pp. 375–397.
- Janossy, D. (1987) Pleistocene Vertebrate Faunas of Hungary, Elsevier, Amsterdam, 208 pp.
- Jessop, R.F. (1930) *The Archaeology of Kent*. Methuen, London, 272 pp.
- John, D.T. (1980) The soils and superficial deposits on the North Downs of Surrey. In *The Shaping of Southern England* (ed. D.K.C. Jones), Institute of British Geographers Special Publication 11, Academic Press, London, pp. 101–30.
- John, D.T. and Fisher, D.F. (1984) The stratigraphical and geomorphological significance of the Red Crag fossils at Netley Heath, Surrey: a review and re-appraisal. *Proceedings of the Geologists' Association*, **95**, 235–47.
- Johnson, J.P. (1901) Additions to the Palaeolithic fauna of the Uphall Brickyard, Ilford, Essex. *Essex Naturalist*, 11, 209–12.
- Jones, D.K.C. (1974) The influence of the

Calabrian transgression on the drainage evolution of south-east England. In *Progress in Geomorphology* (eds E.H. Brown and R.S. Waters), Institute of British Geographers, Special Publication 7, Academic Press, London, pp. 139–158.

- Jones, D.K.C. (1981) The Geomorphology of the British Isles: Southeast and Southern England. Methuen, London and New York, 332 pp.
- Jones, T.R. (1850) Description of the Entomostraca of the Pleistocene beds of Newbury, Copford, Clacton and Grays. *Annals and Magazine of Natural History, Series 2*, 6, 25–71.
- De Jong, J. (1988) Climatic variability during the past three million years, as indicated by vegetational evolution in northwest Europe and with emphasis on data from the Netherlands. *Philosophical Transactions of the Royal Society of London*, **B318**, 603–17.
- Jukes-Browne, A.J. and White, H.J.O. (1908) *The Geology of the Country around Henley-on-Thames and Wallingford*, Memoir of the Geological Survey of Great Britain, 113 pp.
- Kahlke, H.D. (ed.) (1965) Das Pleistozän von Voigtstedt. Paläeontologische Abhandlungen, A11 2/3, 227–692.
- Kahlke, H.D. (1969) Das Pleistozän von Süssenborn. Paläeontologische Abhandlungen, A111 3/4, 367–788.
- Kahlke, H.D. (1975) The macrofaunas of continental Europe during the Middle Pleistocene: stratigraphic sequence and problems of intercorrelation. In After the Australopithecines: Stratigraphy, Ecology and Culture Change in the Middle Pleistocene (eds K.W. Butzer and G.L. Isaac), Mouton, The Hague, pp. 309–74.
- Keen, D.H. (1990) Significance of the record provided by Pleistocene fluvial deposits and their included molluscan faunas for palaeoenvironmental reconstruction and stratigraphy: case study from the English Midlands. *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology*, **80**, 25–34.
- Keith, A. (1939) A resurvey of the anatomical features of the Piltdown Skull with some observations on the recently discovered Swanscombe Skull. Parts I and II. *Journal of Anatomy, London*, 73, 155–85 and 234–54.
- Kellaway, G.A., Horton, A. and Poole, G. (1971) The development of some Pleistocene structures in the Cotswolds and Upper Thames

Basin. Bulletin of the Geological Survey of Great Britain, 37, 1–28.

- Kelly, M.R. (1964) The Middle Pleistocene of north Birmingham. *Philosophical Transactions of the Royal Society of London*, B247, 533–92.
- Kemp, R.A. (1983) Stebbing: the Valley Farm palaeosols layer. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 154–8.
- Kemp, R.A. (1984) Quaternary soils in southern East Anglia and the Lower Thames Basin. Unpublished Ph.D. thesis, University of London.
- Kemp, R.A. (1985a) The Valley Farm Soil in southern East Anglia. In Soils and Quaternary Landscape Evolution (ed. J. Boardman), Wiley, Chichester, pp. 179–96.
- Kemp, R.A. (1985b) The decalcified Lower Loam at Swanscombe, Kent: a buried Quaternary soil. Proceedings of the Geologists' Association, 96, 343–55.
- Kemp, R.A. (1987a) Genesis and environmental significance of a buried Middle Pleistocene soil in eastern England. *Geoderma*, 41, 49–77.
- Kemp, R.A. (1987b) The interpretation and environmental significance of a buried soil near Ipswich airport, Suffolk. *Philosophical Transactions of the Royal Society of London*, B317, 365–91.
- Kemp, R.A. (1991) Micromorphology of the buried Quaternary soil within Burchell's 'Ebbsfleet Channel', Kent. *Proceedings of the Geologists' Association*, 102, 275–87.
- Kennard, A.S. (1904) Notes on a palaeolith from Grays, Essex. *Essex Naturalist*, 13, 112–13.
- Kennard, A.S. (1916) The Pleistocene succession in England. Proceedings of the Prehistoric Society of East Anglia, 2, 249–67.
- Kennard, A.S. (1924) The Pleistocene nonmarine Mollusca of England. Proceedings of the Malacological Society of London, 16, 84–97.
- Kennard, A.S. (1938) Report on the non-marine Mollusca from the Middle Gravels of the Barnfield Pit. Journal of the Royal Anthropological Institute of London, 68, 28–30.
- Kennard, A.S. (1942) Faunas of the High Terrace at Swanscombe. Proceedings of the Geologists' Association, 53, 105.
- Kennard, A.S. (1944) The Crayford Brickearths. Proceedings of the Geologists' Association, 55, 121–69.

402

- Kennard, A.S. and Woodward, B.B. (1897) The post-Pliocene non-marine Mollusca of Essex. *Essex Naturalist*, **10**, 87–109.
- Kennard, A.S. and Woodward, B.B. (1900) The Pleistocene non-marine Mollusca of Ilford. *Proceedings of the Geologists' Association*, 16, 282–6.
- Kennard, A.S. and Woodward, B.B. (1907) Notes on the post-Pliocene Mollusca of the Milne collection. *Proceedings of the Malacological Society of London*, 7, 261–3.
- Kennard, A.S. and Woodward, B.B. (1923) On the non-marine Mollusca of Clacton-on-Sea. *Quarterly Journal of the Geological Society* of London, 79, 629–34.
- Kennard, A.S. and Woodward, B.B. (1924) Appendix 3: The Pleistocene non-marine Mollusca. *In* Sandford, K.S., The river gravels of the Oxford district, *Quarterly Journal of the Geological Society of London*, **80**, 170–5.
- Kerney, M.P. (1959a) An interglacial tufa near Hitchin, Hertfordshire. *Proceedings of the Geologists' Association*, 70, 322-37.
- Kerney, M.P. (1959b) Pleistocene non-marine Mollusca of the English interglacial deposits. Unpublished Ph.D. thesis, University of London.
- Kerney, M.P. (1971) Interglacial deposits at Barnfield Pit, Swanscombe, and their molluscan fauna. *Journal of the Geological Society of London*, 127, 69–86.
- Kerney, M.P. and Sieveking, G. deG. (1977) Northfleet. In South East England and the Thames Valley (eds E.R. Shephard-Thorn and J.J. Wymer), Guide Book for excursion A5, X INQUA Congress, Birmingham, Geoabstracts, Norwich, pp. 44–6.
- Kerney, M.P., Gibbard, P.L., Hall, A.R., et al. (1982) Middle Devensian river deposits beneath the 'Upper Floodplain' terrace of the River Thames at Isleworth, West London. Proceedings of the Geologists' Association, 93, 385–93.
- King, W.B.R. and Oakley, K.P. (1936) The Pleistocene succession in the lower part of the Thames valley. *Proceedings of the Prebistoric Society*, 1, 52–76.
- Klie, W. (1938) Krebstiere oder Crustacea III; Ostracoda, Muschelkrebse. In *Die Tierwelt Deutschlands* (ed. F. Dahl), **Band 34**, Jena, pp. 1–130.
- Koenigswald, W. von. (1973) Veranderungen in der Kleinäugerfauna von Mitteleuropa zwischen Cromer und Eem (pleistozaen),

Eiszeitalter und Gegenwart, 23-24, 159-67.

- Van Kolfschoten, T. (1988) The Pleistocene mammalian faunas from Zuurland boreholes at Brielle, The Netherlands. *Mededelingen Werkgroep Tertiaire and Kwartaire Geologie*, 25, 73–86.
- Kukla, G.J. (1975) Loess stratigraphy of Central Europe. In After the Australopithecines: Stratigraphy, Ecology and Culture Change in the Middle Pleistocene (eds K.W. Butzer and G.L. Isaac), Mouton, The Hague, pp. 99–188.
- Kukla, G.J. (1977) Pleistocene land-sea correlations. I. Europe. *Earth Science Reviews*, 13, 307–74.
- Kurtén, B. (1959) On the bears of the Holsteinian Interglacial. Acta Universitatis Stockholmiensis, Stockholm Contributions in Geology, 2, 73–102.
- Lacaille, A.D. (1940) The palaeoliths from the gravels of the Lower Boyn Hill Terrace around Maidenhead. *Antiquaries Journal*, 20, 245–71.
- Lacaille, A.D. (1960) On Palaeolithic choppers and cleavers (notes suggested by some Buckinghamshire examples) *Records of Bucks*, 16, 330–41.
- Lake, R.D., Ellison, R.A., Hollyer, S.E., et al. (1977) Buried channel deposits in the southeast Essex area: their bearing on Pleistocene palaeogeography. Report of the Institute of Geological Sciences, 77/21.
- Lake, R.D., Ellison, R.A., Henson, M.R., *et al.* (1986) *The Geology of the Country around Southend and Foulness*, Memoir of the Geological Survey of Great Britain, 85 pp.
- Lautridou, J-P. (1982) The Quaternary of Normandy. Field Guide, Quaternary Research Association, Cambridge, 88 pp.
- Lautridou, J-P., Masson, M., Paepe, R., et al. (1974) Loess, nappes aluviales et tuf de St-Pierre-les-Elbeuf, près de Rouen; les terraces de la Seine de Muids à Caudebec. Bulletin de l'Association Francaise pour l'Etude Quaternaire, Supplément, 3–4, 193–201.
- Lautridou, J-P., Monnier, J-L., Mortazec-Kerfourn, M-T., et al. (1983) Les subdivisions du Pléistocène de la France septentrionale: stratigraphie et paléolithique. In Quaternary Glaciations in the Northern Hemisphere (eds O. Billards, O. Conchon and F.W. Shotton), UNESCO – International Geological Correlation Programme, Project 73/1/24 Report 9, Paris 1982, pp. 148–70.

Leach, A.L. (1913) On buried channels in the

Dartford Heath Gravel. Proceedings of the Geologists' Association, 24, 337–44.

- Leakey, L.S.B. (1972) Homo sapiens in the Middle Pleistocene and the evidence of Homo sapiens evolution. In *The Origin of Homosapiens* (ed. F. Bordes), UNESCO, Paris, pp. 25–9.
- Leonardi, G. and Petronio, C. (1976) The fallow deer of European Pleistocene. *Geologica Roma*, **15**, 1–67.
- Lindroth, C.H. (1985) The Carabidae (Coleoptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* (Copenhagen), **15**, 1–228.
- Linke, G., Katzenberg, O. and Grün, R. (1985) Description and ESR dating of the Holsteinian interglaciation. *Quaternary Science Reviews*, 4, 319–31.
- Lister, A.M. (1986) New results on deer from Swanscombe, and the stratigraphical significance of deer in the Middle and Upper Pleistocene of Europe. *Journal of Archaeological Science*, 13, 319–38.
- Lister, A.M. (1989) Mammalian faunas and the Wolstonian debate. In West Midlands (ed. D.H. Keen), Field Guide, Quaternary Research Association, Cambridge, pp. 5–11.
- Lister, A.M., McGlade, J.M. and Stuart, A.J. (1990) The early Middle Pleistocene vertebrate fauna from Little Oakley, Essex. *Philo*sophical Transactions of the Royal Society of London, B328, 359–85.
- Lonsdale, C.A. (1978) A sedimentological investigation of a supposed Ipswichian Interglacial site at Purfleet, Essex. Unpublished M.Sc. thesis, City of London Polytechnic and Polytechnic of North London.
- Lucht, W.H. (1987) *Die Käfer Mitteleuropas, Katalog*, Geoke and Evers, Kreleid, 342 pp.
- Lyell, C. (1865) *Elements of Geology*, 6th edn, John Murray, London, 294 pp.
- McGregor, D.F.M. and Green, C.P. (1978) Gravels of the River Thames as a guide to Pleistocene catchment changes. *Boreas*, 7, 197–203.
- McGregor, D.F.M. and Green, C.P. (1983a) Postdepositional modification of Pleistocene terraces of the River Thames. *Boreas*, 12, 23–33.
- McGregor, D.F.M. and Green, C.P. (1983b) Gerrards Cross. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 80–4.
- McGregor, D.F.M. and Green, C.P. (1983c) Lithostratigraphic subdivisions in the gravels

of the proto-Thames between Hemel Hempstead and Watford. *Proceedings of the Geologists' Association*, 94, 83–5.

- McGregor, D.F.M. and Green, C.P. (1986) Early and Middle Pleistocene gravel deposits of the Thames – development of a lithostratigraphic model. In *Clast Lithological Analysis* (ed. D.R. Bridgland), Technical Guide No. 3, Quaternary Research Association, Cambridge, pp. 95–115.
- McKeown, M.C. and Samuel, M.D.A. (1985) Regional Study of the Sand and Gravel Resources of Essex and South Suffolk. British Geological Survey, Keyworth.
- McNabb J. (1989) Sticks and stones: a possible experimental solution to the question of how the Clacton spear point was made. *Proceedings of the Prehistoric Society*, **55**, 251–71.
- MacRae, R.J. (1982) Palaeolithic artefacts from Berinsfield, Oxfordshire. Oxoniensa, 47, 1–11.
- MacRae, R.J. (1985) Palaeolithic archaeology of the Upper Thames Basin. *In* The chronology and environmental framework of early Man in the Upper Thames Valley (eds D.J. Briggs, G.R. Coope and D.D. Gilbertson), *British Archaeological Reports, British Series*, 137, 8–25.
- MacRae, R.J. (1987) The great giant handaxe stakes. *Lithics*, 8, 15–7.
- MacRae, R.J. (1988) The Palaeolithic of the Upper Thames and its quartzite implements. In Non-flint stone tools and the Palaeolithic occupation of Britain (eds R.J. MacRae and N. Moloney), British Archaeological Reports, British Series, 189, 123–54.
- MacRae, R.J. (1989) Belt, shoulder-bag or basket? An enquiry into handaxe transport and flint sources. *Lithics*, **10**, 2–8.
- MacRae, R.J. (1991) New finds and old problems in the Lower Palaeolithic of the Upper Thames valley. *Lithics*, **11**, 3–15.
- MacRae, R.J. and Moloney, N. (1988) Gazetteer of Lower Palaeolithic non-flint artefacts in Great Britain. *In* Non-flint stone tools and the Palaeolithic occupation of Britain (eds R.J. MacRae and N. Moloney), *British Archaeological Reports, British Series*, 189, 243-63.
- Maddy, D. (1989) The Middle Pleistocene of the Rivers Severn and Avon. Unpublished Ph.D. thesis, University of London.
- Maddy, D., Keen, D.H., Bridgland, D.R., et al. (1991a) A revised model for the Pleistocene

development of the River Avon, Warwickshire. Journal of the Geological Society of London, 148, 473–84.

- Maddy, D., Lewis, S.G. and Green, C.P. (1991b) A review of the stratigraphic significance of the Wolvercote Terrace of the Upper Thames valley. *Proceedings of the Geologists' Association*, **102**, 217–25.
- Manning, P. and Leeds, E.T. (1921) An archaeological survey of Oxfordshire. Archaeologia, 71, 227–65.
- Marston, A.T. (1937) The Swanscombe Skull. Journal of the Royal Anthropological Institute, 67, 339–406.
- Marston, A.T. (1942) Flint industries of the High Terrace at Swanscombe. *Proceedings of the Geologists' Association*, **53**, 106.
- Martinson, D.G., Pisias, N.J., Hayes, J.D., *et al.* (1987) Age dating and the orbital theory of the ice ages, development of a high resolution nought to 300,000 year chronostratigraphy. *Quaternary Research*, **27**, 1–29.
- Meijer, T. (1985) Maastricht-Belvedere: stratigraphy, palaeoenvironment and archaeology of the Middle and Late Pleistocene deposits. *Mededelingen Rijks Geologische Dienst*, 39, 76–103.
- Meijer, T. and Preece, R.C. (in press) Malacological evidence relating to the stratigraphical position of the Cromerian. In *The Early Middle Pleistocene of Europe* (eds P.L. Gibbard and C. Turner), A.A. Balkema, Rotterdam.
- Miall, A.D. (1977) A review of the braided river depositional environment. *Earth Science Reviews*, 13, 1–62.
- Miller, G.H. and Mangerud, J. (1985) Aminostratigraphy of European marine interglacial deposits. *Quaternary Science Reviews*, 4, 215–78.
- Miller, G.H., Hollin, J.T. and Andrews, J. (1979) Aminostratigraphy of UK Pleistocene deposits. *Nature, London*, 281, 539–43.
- Mitchell, G.F., Penny, L.F., Shotton, F.W., et al. (1973) A Correlation of Quaternary Deposits in the British Isles. Geological Society of London Special Report, No. 4, 99 pp.
- Moffat, A.J. (1980) The Plio-Pleistocene transgression in the northern part of the London Basin – a re-examination. Unpublished Ph.D. thesis, University of London.
- Moffat, A.J. (1986) Quartz signatures in Plio-Pleistocene gravels in the northern part of the London Basin. In *Clast Lithological*

*Analysis* (ed. D.R. Bridgland), Technical Guide No. 3, Quaternary Research Association, Cambridge, pp. 117–28.

- Moffat, A.J. and Catt, J.A. (1982) The nature of the pebbly clay drift at Epping Green, southeast Hertfordshire. *Transactions of the Hertfordshire Natural History Society*, **28**, 16–24.
- Moffat, A.J. and Catt, J.A. (1983) A new excavation in Plio-Pleistocene deposits at Little Heath. *Transactions of the Hertfordshire Natural History Society*, **29**, 5–10.
- Moffat, A.J. and Catt, J.A. (1986a) A re-examination of the evidence for a Plio-Pleistocene marine transgression on the Chiltern Hills. II. Drainage patterns. *Earth Surface Processes and Landforms*, **11**, 169–80.
- Moffat, A.J. and Catt, J.A. (1986b), A re-examination of the evidence for a Plio-Pleistocene marine transgression on the Chiltern Hills, III. Deposits. *Earth Surface Processes and Landforms*, 11, 233–47.
- Moffat, A.J., Catt, J.A., Webster, R. *et al.* (1986) A re-examination of the evidence for a Plio-Pleistocene marine transgression on the Chiltern hills, I. Structures and surfaces. *Earth Surface Processes and Landforms*, **11**, 95–106.
- Monckton, H.W. (1892) On the gravels south of the Thames from Guildford to Newbury. *Quarterly Journal of the Geological Society* of London, **48**, 29–59.
- Monckton, H.W. and Herries, R.S. (1891) On some hill gravels north of the Thames. *Proceedings of the Geologists' Association*, 12, 108–14.
- Montagu, M.F.A. (1960) An Introduction to Physical Anthropology, 3rd edn, Charles G. Thomas, Springfield, Illinois.
- Morant, G.M. (1938) The form of the Swanscombe Skull. *Journal of the Royal Anthropological Institute of London*, **68**, 67–97.
- Morgan, A. (1969) A Pleistocene fauna and flora from Great Billing, Northamptonshire, England. Opuscula Entomologica, Lund, 34, 109–29.
- Morgan, A.V. (1973) Late Pleistocene environmental changes indicated by fossil insect faunas of the English Midlands. *Boreas*, 2, 173–212.
- Morris, J. (1836) On a freshwater deposit containing mammalian remains, recently discovered at Grays, Essex. *Magazine of Natural History, Series 1*, 9, 261–4.
- Newcomer, M.H. (1971) Conjoined flakes from

the Lower Loam, Barnfield Pit, Swanscombe. Proceedings of the Royal Anthropological Institute of London [for 1970], pp. 51-59.

- Newton, E.T. (1895) On a human skull and limb bones found in the Palaeolithic terrace gravel at Galley Hill, Kent. *Quarterly Journal of the Geological Society of London*, **51**, 505–27.
- Newton, E.T. (1907) Note on specimens of 'Rhaxella-chert' or 'Arngrove stone' from Dartford Heath. *Proceedings of the Geologists' Association*, 20, 127–8.
- Newton, R.B. (1916) On the conchological features of the Lenham Sandstone of Kent. *Journal of Conchology, London*, **15**, 56–84, 97–118 and 137–49.
- Newton, W.M. (1901) Kent: flint implements. The occurrence in a very limited area of the rudest with the finest forms of worked stones. *Man*, 1, 81–2.
- Newton, W.M. (1930) A remarkable gravel pit. Man, 30, 41-4.
- Oakley, K.P. (1937) Field meeting at Taplow, Burnham and Iver, Bucks. *Proceedings of the Geologists' Association*, **48**, 276–9.
- Oakley, K.P. (1939) A Survey of the Prehistory of the Farnham District (Surrey), Part 1 Geology and Palaeolithic Studies, Surrey Archaeological Society, Guildford, pp. 3–58.
- Oakley, K.P. (1943) The future of Quaternary research in Britain. *South East Naturalist*, 48, 25–32.
- Oakley, K.P. (1949) *Man the Toolmaker*, 1st edn, British Museum (Natural History), London, 98 pp.
- Oakley, K.P. (1952) Swanscombe Man. Proceedings of the Geologists' Association, 63, 271–300.
- Oakley, K.P. (1964) The evidence of fire at Swanscombe. In *The Swanscombe Skull: a Survey of Research on a Pleistocene Site* (ed. C.D. Ovey), Royal Anthropological Institute, Occasional Paper No. 20, pp. 63–6.
- Oakley, K.P. and Gardiner, E. (1964) Analytical data on the Swanscombe bones. In *The Swanscombe Skull: A Survey of Research on a Pleistocene Site* (ed. C.D. Ovey), Royal Anthropological Institute, Occasional Paper No. 20, pp. 117–23.
- Oakley, K.P. and King, W.B.R. (1945) Age of the Baker's Hole Coombe Rock, Northfleet, Kent. *Nature, London*, **155**, 51–2.
- Oakley, K.P. and Leakey, M. (1937) Report on excavations at Jaywick Sands, Essex (1934), with some observations on the Clactonian

industry, and on the fauna and geological significance of the Clacton channel. *Proceedings of the Prehistoric Society*, **3**, 217–60.

- Oakley, K.P., Andrews, P., Keeley, L.H., *et al.* (1977) A reappraisal of the Clacton spearpoint. *Proceedings of the Prehistoric Society*, **43**, 13–30.
- Ohel, M.Y. (1977) On the Clactonian reexamined, redefined, reinterpreted. *Current Antbropologist*, **18:2**, 329–31.
- Ohel, M.Y. (1979) The Clactonian: an independent complex or an integral part of the Acheulian? *Current Anthropologist*, **20**:4, 685–744.
- Osborne, P.J. (1980) The insect fauna of the organic deposits at Sugworth and its environmental and stratigraphic implications. *In* Shotton, F.W., Goudie, A.S., Briggs, D.J. *et al.* Cromerian interglacial deposits at Sugworth, near Oxford, England, and their relation to the Plateau Drift of the Cotswolds and the terrace sequence of the Upper and Middle Thames. *Philosophical Transactions of the Royal Society of London*, **B289**, 119–33.
- Ovey, C.D. (ed.) (1964) *The Swanscombe Skull: a Survey of Research on a Pleistocene Site*, Royal Anthropological Institute, Occasional Paper No. 20, 215 pp.
- Owen, R. (1846) *History of the British Fossil Mammals and Birds*, John Van Voorst, London, 560 pp.
- Owen, R. (1855) Description of a fossil cranium of the musk-buffalo from the 'lower level drift' at Maidenhead, Bucks. *Quarterly Journal of the Geological Society of London*, 12, 124–31.
- Palmer, S. (1975) A Palaeolithic site at North Road, Purfleet, Essex. *Transactions of the Essex Archaeological Society*, 7, 1–13.
- Parks, D.A. and Rendell, H.M. (1988) TL dating of brickearths from SE England. *Quaternary Science Reviews*, 7, 305–8.
- Paterson, T.T. (1940) The Swanscombe Skull: a defence. Proceedings of the Prehistoric Society, 6, 166–9.
- Penck, A and Brückner, E. (1909) *Die Alpen im Eiszeitalter*, Tauchmitz, Leipzig, 3 vols, 1199 pp.
- Perrin, R.M.S., Davies, H. and Fysh, M.D. (1973) Lithology of the Chalky Boulder Clay. *Nature, London*, **245**, 101–4.
- Perrin, R.M.S., Rose, J. and Davies, H. (1979) The distribution, variation and origins of pre-

Devensian tills in eastern England. *Philosophical Transactions of the Royal Society of London*, **B287**, 535–70.

- Pettit, M. and Gibbard, P.L. (1980) Palaeobotany. In Shotton, F.W., Goudie, A.S., Briggs, D.J. et al. Cromerian interglacial deposits at Sugworth, near Oxford, England, and their relation to the Plateau Drift of the Cotswolds and the terrace sequence of the Upper and Middle Thames, Philosophical Transactions of the Royal Society of London, B289, 63.
- Phillips, J. (1871) *The Geology of Oxford and the Valley of the Thames*, Clarendon Press, Oxford, 523 pp.
- Phillips, L.M. (1976) Pleistocene vegetational history and geology in Norfolk. *Philosophical Transactions of the Royal Society of London*, B275, 215–86.
- Picton, H. (1912) Observations on the bone bed at Clacton. *Proceedings of the Prehistoric Society*, 1, 158–9.
- Pike, K. and Godwin, H. (1953) The interglacial at Clacton-on-Sea, Essex. *Quarterly Journal* of the Geological Society of London, 108, 261–72.
- Pinchemel, P. H. (1954) Les Plaines de Craie du Nord-ouest du Bassin Parisien et du Sud-est du Bassin de Londres et leurs Bordures. Librairie Armand Collin, Paris, 502 pp.
- Pocock, T.I. (1903) On the drifts of the Thames valley near London. *Summary of Progress, Geological Survey of Great Britain*, for 1902, 199–207.
- Pocock, T.I. (1908) *The Geology of the Country around Oxford*. Memoir of the Geological Survey of Great Britain, 142 pp.
- Podmore, J.A. (1976) The geomorphology of a selected archaeological site in South Essex; Botany Pit, Purfleet, Essex, Unpublished B.Sc. thesis, City of London Polytechnic, 34 pp.
- Porrenga, D.H. (1967) Glauconite and chamosite as depth indicators in the marine environment. *Marine Geology*, 5, 495–501.
- Poulton, E.B. (1880) On mammalian remains and tree trunks in Quaternary sands and gravels at Reading. *Quarterly Journal of the Geological Society of London*, **36**, 296–306.
- Preece, R.C. (1988) A second British interglacial record of *Margitifera auricularia*. *Journal of Conchology*, **33**, 50–1.
- Preece, R.C. (1989) Additions to the molluscan fauna of the early Middle Pleistocene deposits at Sugworth, near Oxford, including the

first British Quaternary record of *Perforatella bidentata* (Gmelin), *Journal of Conchology*, 33, 179–82.

- Preece, R.C. (1990a) Alfred Santer Kennard (1870–1948): his contribution to malacology, Quaternary research and to the Geologists' Association. *Proceedings of the Geologists' Association*, **101**, 239–58.
- Preece, R.C. (1990b) The molluscan fauna of the Middle Pleistocene interglacial deposits at Little Oakley, Essex, and its environmental and stratigraphic implications. *Philosophical Transactions of the Royal Society of London*, B328, 387–407.
- Prestwich, J. (1854) On the structure of the strata between the London Clay and the Chalk in the London and Hampshire Tertiary systems. Part II. The Woolwich and Reading Series. *Quarterly Journal of the Geological Society of London*, **10**, 75–170.
- Prestwich, J. (1855) Note on the gravel near Maidenhead in which the skull of the muskbuffalo was found. *Quarterly Journal of the Geological Society of London*, **12**, 131–3.
- Prestwich, J. (1858a) On the age of the sands and iron-sandstones on the North Downs. *Quarterly Journal of the Geological Society* of London, 14, 322–35.
- Prestwich, J. (1858b) On the occurrence of the boulder clay or Northern Clay Drift, at Bricket Wood, near Watford. *Geologist*, **1**, 241.
- Prestwich, J. (1881) On the extension into Essex, Middlesex and other inland counties, of the Mundesley and Westleton Beds, in relation to the age of certain hill-gravels of some of the valleys of the south of England. *Geological Magazine*, **8**, 466–8.
- Prestwich, J. (1882) The occurrence of *Cyrena fluminalis* at Summertown near Oxford. *Geological Magazine*, 9, 49–51.
- Prestwich, J. (1890a) On the relation of the Westleton Beds, or pebbly sands of Suffolk, to those of Norfolk, and on their extension inland; with some observations on the period of the final elevation and denudation of the Weald and of the Thames valley. Part I. Quarterly Journal of the Geological Society of London, 46, 84–119.
- Prestwich, J. (1890b) On the relation of the Westleton Beds, or pebbly sands of Suffolk, to those of Norfolk, and on their extension inland; with some observations on the period of the final elevation and denudation of the Weald and of the Thames valley. Part II.

Quarterly Journal of the Geological Society of London, 46, 120–54.

- Prestwich, J. (1890c) On the relation of the Westleton Beds, or pebbly sands of Suffolk, to those of Norfolk, and on their extension inland; with some observations on the period of the final elevation and denudation of the Weald and of the Thames valley. Part II. Quarterly Journal of the Geological Society of London, 46, 155–81.
- Prestwich, J. (1891) On the age, formation and successive drift-stages of the valley of the Darent; with remarks on the Palaeolithic implements of the district and on the origin of its Chalk escarpment. *Quarterly Journal of the Geological Society of London*, 47, 126–63.
- Ransome, E.R. (1890) Fossil Mammalia at Clacton-on-Sea. *Essex Naturalist*, 4, 201.
- Reading, H.G. (1978) Sedimentary Environments and Facies. Blackwell Scientific, Oxford, 557 pp.
- Reid, C. (1890) *The Pliocene Deposits of Britain*, Memoir of the Geological Survey of England and Wales, 326 pp.
- Reid, C. (1897) On Pleistocene plants from Casewick, Shacklewell and Grays. *Quarterly Journal of the Geological Society of London*, 53, 463–4.
- Reid, C. (1899) The origin of the British flora. Dalau, London, 191 pp.
- Reid, C. (1900) [untitled comments on the high-level gravel at Stanmore]. In Anon (ed.) Field work, Tertiary, London Basin, Summary of Progress, Geological Survey of Great Britain [for 1899], p. 140.
- Reid, C. and Chandler, M.E.J. (1923) The fossil flora of Clacton-on-Sea. *Quarterly Journal of the Geological Society of London*, 79, 619–23.
- Reineck, H-E. and Singh, I.B. (1975) Depositional Sedimentary Environments, Springer-Verlag, Berlin, 439 pp.
- Richardson, L. (1935) Weekend field meeting in the Witney district. *Proceedings of the Geologists' Association*, 46, 403–11.
- Richardson, L. and Sandford, K.S. (1963) Ditchford Gravel Pit near Stretton-on-Fosse, Gloucestershire and the occurrence of a mammoth tooth. *Proceedings of the Cotteswolds Naturalists Field Club*, 33, 172–6.
- Richmond, G.M. and Fullerton, D.S. (1986) Introduction to Quaternary glaciations in the United States of America. *Quaternary Sci*-

ence Reviews, 5, 3-10.

- Roberts, M.B. (1986) Excavation of the Lower Palaeolithic site at Amey's Eartham Pit, Boxgrove, West Sussex: a preliminary report. *Proceedings of the Prehistoric Society*, **52**, 215–45.
- Robinson, J.E. (1978) Ostracods from deposits in the Vale of St Albans. *Quaternary Newsletter*, 2, 8–9.
- Robinson, J.E. (1980) The ostracod fauna of the interglacial deposits at Sugworth, Oxfordshire. *Philosophical Transactions of the Royal Society of London*, **B289**, 99–106.
- Robinson, J.E. (1983) Ostracods from the Westmill Lower Gravels, Westmill. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 132.
- Robinson, J.E. (1990) The Ostracod fauna of the interglacial deposits at Little Oakley, Essex. *Philosophical Transactions of the Royal Society of London*, **B328**, 409–23.
- Robson, P. (1976) The Sand and Gravel Resources of the Thames Valley, the Country between Lechlade and Standlake, Mineral Assessment Report of the Institute of Geological Sciences 23, 141 pp.
- Roe, D.A. (1964) The British Lower and Middle Palaeolithic: some problems, methods of study and preliminary results. *Proceedings of the Prebistoric Society*, 30, 245–67.
- Roe, D.A. (1968a) British Lower and Middle Palaeolithic hand-axe groups. *Proceedings of* the Prehistoric Society, 34, 1–82.
- Roe, D.A. (1968b) A Gazetteer of British Lower and Middle Palaeolithic Sites, Council for British Archaeology Research Report No. 8, 355 pp.
- Roe, D.A. (1975) Some Hampshire and Dorset hand-axes and the question of Early Acheulian in Britain. *Proceedings of the Prebistoric Society*, 41, 1–9.
- Roe, D.A. (1976) Palaeolithic industries in the Oxford Region. In *Field Guide to the Oxford Region* (ed. D.A. Roe), Quaternary Research Association, Oxford, pp. 36–43.
- Roe, D.A. (1977) Fordwich and Sturry. In *South East England and the Thames Valley* (eds E.R. Shephard-Thorn and J.J. Wymer), Guide Book for Excursion A5, X INQUA Congress, Birmingham, Geoabstracts, Norwich, pp. 53–4.
- Roe, D.A. (1981) The Lower and Middle Palaeolithic Periods in Britain. Routledge

and Kegan Paul, London, 324 pp.

- Rolfe, W.D.I. (1958) A recent temporary section through Pleistocene deposits at Ilford. *Essex Naturalist*, **30**, 93–103.
- Rose, J. (1974) Small scale variability of some sedimentary properties of lodgement and slumped till. *Proceedings of the Geologists' Association*, 85, 223–37.
- Rose, J. (1979) River terraces and sea level change. Brighton Polytechnic Geographic Society Magazine, 3, 13–30.
- Rose, J. (1983a) Early and Middle Pleistocene sediments and palaeosols in west and central Essex. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 135–9.
- Rose, J. (1983b) Introduction. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 1–7.
- Rose, J. (1987) Status of the Wolstonian glaciation in the British Quaternary. *Quaternary Newsletter*, 53, 1–9.
- Rose, J. (1988) Stratigraphic nomenclature for the British Middle Pleistocene – procedural dogma or stratigraphic common sense. *Quaternary Newsletter*, 54, 15–20.
- Rose, J. (1989) Tracing the Baginton–Lillington Sands and Gravels from the West Midlands to East Anglia. In *West Midlands* (ed. D.H. Keen), Field Guide, Quaternary Research Association, Cambridge, pp. 102–10.
- Rose, J. (1991) Stratigraphic basis of the 'Wolstonian glaciation', and retention of the term 'Wolstonian' as a chronostratigraphic stage name a discussion. In *Central East Anglia and the Fen Basin* (eds S.G. Lewis, C.A. Whiteman and D.R. Bridgland), Field Guide, Quaternary Research Association, London, pp. 15–20.
- Rose, J. and Allen, P. (1977) Middle Pleistocene stratigraphy in south-east Suffolk. *Journal of the Geological Society of London*, 133, 83–102.
- Rose, J., Allen, P. and Hey, R.W. (1976) Middle Pleistocene stratigraphy in southern East Anglia. *Nature, London*, **263**, 492–4.
- Rose, J., Sturdy, R.G., Allen, P., et al. (1978) Middle Pleistocene sediments and palaeosols near Chelmsford, Essex. Proceedings of the Geologists' Association, 89, 91–6.
- Rose, J., Allen, P., Kemp, R.A., *et al.* (1985a) The early Anglian Barham Soil of eastern England. In *Soils and Quaternary Landscape*

*Evolution* (ed. J. Boardman), Wiley, Chichester, pp. 197–229.

- Rose, J., Boardman, J., Kemp, R.A., *et al.* (1985b) Palaeosols and the interpretation of the British Quaternary stratigraphy. In *Geomorphology and Soils* (eds K. Richards, R. Arnett and S. Ellis), Allen and Unwin, London, p. 348–75.
- Ross, B.R.M. (1932) The physiographic evolution of the Kennet-Thames. *Report of the British Association, London* [for 1931], p. 368.
- Rossiter, J.R. (1972) Sea level observations and their secular variations. *Philosophical Transactions of the Royal Society of London*, A272, 131–9.
- Ruddiman, W.F., Raymo, M.E., Martinson, D.G., et al. (1989) Pleistocene evolution: Northern Hemisphere ice sheets and North Atlantic Ocean. Palaeoceanography, 4, 353–412.
- Salter, A.E. (1896) 'Pebbly gravel' from the Goring Gap to the Norfolk Coast. Proceedings of the Geologists' Association, 14, 389–404.
- Salter, A.E. (1898) Pebbly and other gravels in southern England. *Proceedings of the Geologists' Association*, **15**, 264–86.
- Salter, A.E. (1901) Excursion to Stanmore. Proceedings of the Geologists' Association, 17, 175–6.
- Salter, A.E. (1903) Excursion to Erith and Crayford. *Proceedings of the Geologists' Association*, **18**, 165–6.
- Salter, A.E. (1905) On the superficial deposits of central and parts of southern England. Proceedings of the Geologists' Association, 19, 1–56.
- Sandford, K.S. (1924) The river gravels of the Oxford district. Quarterly Journal of the Geological Society of London, 80, 113–79.
- Sandford, K.S. (1925) The fossil elephants of the Upper Thames basin. *Quarterly Journal of the Geological Society of London*, **81**, 62–86.
- Sandford, K.S. (1926) Pleistocene deposits. In *The Geology of the Country around Oxford* (ed. J. Pringle), Memoir of the Geological Survey of Great Britain, pp. 104–172.
- Sandford, K.S. (1932) Some recent contributions to the Pleistocene succession in England. *Geological Magazine*, **69**, 1–18.
- Sandford, K.S. (1939) Early Man. The Quaternary geology of Oxfordshire with reference to Palaeolithic Man. In *The Victoria County History of Oxfordshire*, **1**, 223–38.
- Sandford, K.S. (1954) River development and

superficial deposits. In *The Oxford Region. A Scientific and Historical Survey* (eds A.F. Martin and R.W. Steel), University Press, Oxford, pp. 21–4.

- Sandford, K.S. (1965) Notes on the gravels of the Upper Thames floodplain between Lechdale and Dorchester. *Proceedings of the Geologists' Association*, 76, 61–75.
- Saner, B.R.M. and Wooldridge, S.W. (1929) River development in Essex. *Essex Naturalist*, 22, 244–50.
- Sarnthein, M., Stremme, H.E. and Mangini, A. (1986) The Holstein interglaciation: time stratigraphic position and correlation to stable-isotope stratigraphy of deep-sea sediments. *Quaternary Research*, 26, 283–96.
- Schreuder, A. (1950) Microtinae from the Middle Gravels of Swanscombe. Annals and Magazine of Natural History, London, Series 12, 3, 629–35.
- Schwarcz, H.P. and Grün, R. (1988) Comment on Sarnthein, M., Stremme, H.E. and Mangini, A. 'The Holstein interglaciation: time stratigraphic position and correlation to stable-isotope stratigraphy of deep-sea sediments'. *Quaternary Research*, 29, 75–9.
- Schwertmann, U., Murad, E. and Schulze, D.G. (1982) Is there Holocene reddening (hematite formation) in soils of axeric temperate areas? *Geoderma*, 27, 209–23.
- Sealy, K.R. and Sealy, C.E. (1956) The terraces of the Middle Thames. *Proceedings of the Geologists' Association*, 67, 369–92.
- Seddon, M.B. and Holyoak, D.T. (1985) Evidence of sustained regional permafrost during deposition of fossiliferous Late Pleistocene sediments at Stanton Harcourt, Oxfordshire, England. *Proceedings of the Geologists' Association*, **96**, 53–73.
- Shackleton, N.J. (1969) The last interglacial in the marine and terrestrial records. *Proceedings of the Royal Society of London*, **B174**, 135–54.
- Shackleton, N.J. (1987) Oxygen isotopes, ice volume and sea level. *Quaternary Science Reviews*, 6, 1835–90.
- Shackleton, N.J. and Opdyke, N.D. (1973) Oxygen Isotope and palaeomagnetic stratigraphy of Equatorial Pacific Core V28–238, Oxygen Isotope temperatures and ice volumes on a 10<sup>5</sup> year – 10<sup>6</sup> year scale. *Quaternary Research*, 3, 39–55.
- Shackleton, N.J. and Opdyke, N.D. (1976) Oxygen-isotope and palaeomagnetic strati-

graphy of Pacific core V28–239: Late Pliocene to latest Pleistocene. *Geological Society of America Memoir*, 145, 449–64.

- Shackleton, N.J., Berger, A. and Peltier, W.R. (1990) An alternative astronomical calibration of the lower Pleistocene time scale based on ODP site 677. *Transactions of the Royal Society of Edinburgh: Earth Sciences*, **81**, 251–61.
- Shephard, R.W. (1976) The geomorphology of a part of the Taplow and Boyn Hill Terrace sequence in south Essex. Unpublished B.Sc. thesis, City of London Polytechnic, 35 pp.
- Sherlock, R.L. (1919) Discussion of the two foregoing papers [Barrow (1919b) and Gilbert (1919a)]. Quarterly Journal of the Geological Society of London, **75**, 46–8.
- Sherlock, R.L. (1922) *The Geology of the Country around Aylesbury and Hemel Hempstead*, Memoir of the Geological Survey of Great Britain, 66 pp.
- Sherlock, R.L. (1924) The superficial deposits of south Buckinghamshire and south Hertford-shire and the old course of the Thames. *Proceedings of the Geologists' Association*, **35**, 1–28.
- Sherlock, R.L. (1929) Discussion on the alleged Pliocene of Buckinghamshire and Hertfordshire. *Proceedings of the Geologists' Association*, 40, 357–70.
- Sherlock, R.L. and Noble, A.H. (1912) On the glacial origin of the clay-with-flints of Buckinghamshire, and on the former course of the Thames. *Quarterly Journal of the Geological Society of London*, **68**, 199–212.
- Sherlock, R.L. and Noble, A.H. (1922) The Geology of the Country around Beaconsfield, Memoir of the Geological Survey of Great Britain, 59 pp.
- Sherlock, R.L. and Pocock, R.M. (1924) *The Geology of the Country around Hertford*, Memoir of the Geological Survey of Great Britain, 66 pp.
- Shotton, F.W. (1953) The Pleistocene deposits of the area between Coventry, Rugby and Leamington and their bearing upon the topographic development of the Midlands. *Philosophical Transactions of the Royal Society of London*, **B237**, 209–60.
- Shotton, F.W. (1968) The Pleistocene succession around Brandon, Warwickshire. *Philosophical Transactions of the Royal Society of London*, **B254**, 387–400.

Shotton, F.W. (1973a) The English Midlands. In

A Correlation of Quaternary Deposits in the British Isles (eds G.F. Mitchell, L.F. Penny, F.W. Shotton and R.G. West), Geological Society of London Special Report, No.4, pp. 18–22.

- Shotton, F.W. (1973b) General principles governing the subdivision of the Quaternary system. In A Correlation of Quaternary Deposits in the British Isles (eds G.F. Mitchell, L.F. Penny, F.W. Shotton and R.G. West), Geological Society of London Special Report, No.4, pp. 1–7.
- Shotton, F.W. (1977) Chronology, climate and marine record, the Devensian stage: its development, limits and substages. *Philosophical Transactions of the Royal Society of London*, **B280**, 107–18.
- Shotton, F.W. (1981) A Lower Pleistocene glaciation in England. In *Quaternary Glaciations in the Northern Hemisphere* (eds D.J. Easterbrook, P. Hansliêk, K-D. Jäger and F.W. Shotton), UNESCO International Geological Correlation Programme, Project 73/1/24, Report 7, Prague 1981, pp. 203–13.
- Shotton, F.W. (1983) Interglacials after the Hoxnian in Britain. In *Quaternary Glaciations in the Northern Hemisphere* (eds O. Billards, O. Conchon and F.W. Shotton), UNESCO – International Geological Correlation Programme, Project 73/1/24, Report 9, Paris 1982, pp. 109–15. Reproduced in *Quaternary Newsletter*, 39, 20–5.
- Shotton, F.W. (1986) Glaciations in the United Kingdom. Quaternary Science Reviews, 5, 293-7.
- Shotton, F.W. and Osborne, P.J. (1965) The fauna of the Hoxnian interglacial deposits of Nechells, Birmingham. *Philosophical Transactions of the Royal Sociey of London*, B248, 353–78.
- Shotton, F.W., Goudie, A.S., Briggs, D.J., *et al.* (1980) Cromerian interglacial deposits at Sugworth near Oxford, England, and their relation to the Plateau Drift of the Cotswolds and the terrace sequence of the Upper and Middle Thames. *Philosophical Transactions of the Royal Society of London*, **B289**, 55–86.
- Shrubsole, O.A. (1898) On some high level gravels in Berkshire and Oxfordshire. *Quarterly Journal of the Geological Society of London*, 54, 585–600.
- Shrubsole, O.A. (1906) Early Man the Palaeolithic age. In A History of the County of Berksbire (ed. W. Page), Victoria History of

the Counties of England, Vol. 1, Archibald Constable, Westminster, pp. 173–80.

- Shrubsole, O.A. and Whitaker, W. (1902) Excursion to Reading. *Proceedings of the Geologists' Association*, 17, 381–3.
- Sibrava, V. (1986a) Scandinavian glaciations in the Bohemian Massif and Carpathian foredeep and their relation to the extraglacial areas. *Quaternary Science Reviews*, 5, 381–6.
- Sibrava, V. (1986b) Correlations of European glaciations and their relation to the deep sea record. *Quaternary Science Reviews*, 5, 433–42.
- Siddiqui, Q.A. (1971) The palaeoecology of nonmarine Pleistocene Ostracoda from Fladbury, Worcestershire and Isleworth, Middlesex. In *Colloque sur la Paléoécologie des Ostracodes* (ed. H.J. Oertli), Bulletin du Centre de Recherches, Société Nationale des Pétroles d'Aquitaine, Pau, Supplément 5, pp. 331–9.
- Simmons, M.B. (1978) *The Sand and Gravel Resources of the Dengie Peninsula*. Mineral Assessment Report of the Institute of Geological Sciences 34, 90 pp.
- Simpson, I.M. and West, R.G. (1958) On the stratigraphy and palaeobotany of a Late Pleistocene organic deposit at Chelford, Cheshire. New Phytologist, 57, 239–50.
- Singer, R., Wymer, J.J., Gladfelter, B.G., et al. (1973) Excavation of the Clactonian Industry at the golf course, Clacton-on-Sea, Essex. *Proceedings of the Prehistoric Society*, 39, 6-74.
- Smith, R.A. (1911) A Palaeolithic industry at Northfleet, Kent. Archaeologia, 62, 515–32.
- Smith, R.A. (1915) Prehistoric problems in geology. Proceedings of the Geologists' Association, 26, 1-20.
- Smith R.A. (1917) Plateau deposits and implements. Proceedings of the Prehistoric Society of East Anglia, 2, 392–408.
- Smith, R.A. (1922) Flint implements of special interest. Archaeologia, 72, 25-40.
- Smith, R.A. (1923) Prehistoric Man in Kent. South East Naturalist, 28, 32-7.
- Smith, R.A. (1926) A Guide to Antiquities of the Stone Age. 3rd edn, British Museum, London, 204 pp.
- Smith, R.A. (1933) Implements from high-level gravels near Canterbury. Proceedings of the Prebistoric Society of East Anglia, 7, 165-70.
- Smith, R.H. and Dewey, H. (1913) Stratification at Swanscombe: report on excavation

made on behalf of the British Museum and HM Geological Survey. *Archaeologia*, 64, 177–204.

- Smith, R.H. and Dewey, H. (1914) The High Terrace of the Thames: report on investigations made on behalf of the British Museum and H.M. Geological Survey in 1913. *Arcbaeologia*, 65, 187–212.
- Smith, W.G. (1883) On a Palaeolithic floor at North East London. Journal of the Anthropological Institute, 13, 357–84.
- Smith, W.G. (1894) Man the Primaeval Savage: His Haunts and Relics from the Hill Tops of Bedfordshire to Blackwall. E. Stanford, London, 349 pp.
- Snelling, A.J.R. (1964) Excavations at the Globe Pit, Little Thurrock, Grays, Essex 1961. *Essex Naturalist*, **31**, 199–208.
- Snelling, A.J.R. (1975) A fossil molluscan fauna at Purfleet, Essex. *Essex Naturalist*, **33**, 104–8.
- Solomon, J.D. (1935) The Westleton Series of East Anglia; its age, distribution and relations. Quarterly Journal of the Geological Society of London, 91, 216–38.
- Sparks, B.W., West, R.G., Williams, R.B.G., et al. (1969) Hoxnian interglacial deposits near Hatfield, Herts. Proceedings of the Geologists' Association, 80, 243–67.
- Spencer, H.E.P. (1966) An Essex fossil ziphoid whale and its implications of the geographical changes in geological times. *Essex Naturalist*, **31**, 348–53.
- Spurrell, F.J.C. (1880) On the discovery of the place where Palaeolithic implements were made at Crayford. *Quarterly Journal of the Geological Society of London*, **36**, 544–8.
- Spurrell, F.J.C. (1883a) Palaeolithic knapping tools and modes of using them. *Journal of the Anthropological Institute*, **13**, 109–18.
- Spurrell, F.J.C. (1883b) Palaeolithic implements found in West Kent. Archaeologia Cantiana, 15, 89–103.
- Spurrell, F.J.C. (1886) A sketch of the history of the rivers and denudation of West Kent. *Report of the West Kent Natural History Society* [for 1886], 53–104.
- Spurrell, F.J.C. (1892) Excursion to Grays Thurrock, Essex. Proceedings of the Geologists' Association, 12, 194.
- Spurrell, F.J.C. (1893) Excursion to Dartford Heath. Proceedings of the Geologists' Association, 13, 70.
- Squirrell, H.C. (1978) The Sand and Gravel

Resources of the Country around Sonning and Henley. Berkshire, Oxfordshire and Buckinghamshire. Mineral Assessment Report of the Institute of Geological Sciences 32, 98 pp.

- Stebbing, W.P.D. (1900) Excursion to Netley Heath and Newlands Corner. *Proceedings of the Geologists' Association*, 16, 524–6.
- Stopes, C. (1903) Palaeolithic implements from the shelly gravel pit at Swanscombe, Kent. Report of the British Association for the Advancement of Science, Southport [1903], pp. 803–4.
- Stopes, H. (1900) On the discovery of *Neritina fluviatalis* with a Pleistocene fauna and worked flints in high terrace gravels of the Thames valley. *Journal of the Antbropological Institute*, 29, 302–3.
- Strand, A. (1946) Nord-Norges Coleoptera. Tromsø Museums Årsbefter Naturbistorisk, 67, 1–699.
- Straw, A. (1979) The geomorphological significance of the Wolstonian glaciation in Eastern England. *Transactions of the Institute of British Geographers*, 4, 540–9.
- Straw, A. (1983) Pre-Devensian glaciation of Lincolnshire (eastern England) and adjacent areas. *Quaternary Science Reviews*, 2, 239–60.
- Stringer, C.B. (1974) Population relationships of later Pleistocene hominids: a multivariate study of available crania. *Journal of Archaeological Science*, 1, 317–42.
- Stringer, C.B. (1978) Some problems in Middle and Upper Pleistocene hominid relationships. In *Recent Advances in Primatology*. *Volume 3. Evolution* (eds D.J. Chivers and K. Joysen), Academic Press, London, pp. 395–418.
- Stringer, C.B. (1983) Our Fossil Relatives More About Man's Place in Evolution, British Museum (Natural History), London, 23 pp.
- Stringer, C.B. (1985) The Swanscombe fossil skull. In *The Story of Swanscombe Man* (ed. K.L. Duff), Kent County Council and Nature Conservancy Council, pp. 14–19.
- Stringer, C.B. (1986) The British fossil hominid record. In *Recent Studies in the Palaeolithic* of Britain and its Nearest Neighbours (ed. S.N. Collcutt), J.R. Collis Publications, Department of Archaeology and Prehistory, Sheffield University, pp. 59–61.

Stringer, C.B., Currant, A.P., Schwarcz, H.P., et

412

al. (1986) Age of Pleistocene faunas from Bacon Hole, Wales. *Nature*, *London*, 320, 59–62.

- Stringer, C.B., Hublin, J.J. and Vandermeersch, B.V. (1984) The origin of anatomically modern humans. In *The Origins of Modern Humans* (eds F.H. Smith and F. Spencer), Alan Liss, New York, pp. 51–135.
- Stuart, A.J. (1974) Pleistocene history of the British vertebrate fauna. *Biological Reviews*, 49, 225–66.
- Stuart, A.J. (1975) The vertebrate fauna of the type Cromerian. *Boreas*, 4, 63–76.
- Stuart, A.J. (1976) The history of the mammal fauna during the Ipswichian/Last Interglacial in England. *Philosophical Transactions of the Royal Society of London*, **B276**, 221–50.
- Stuart, A.J. (1980) The vertebrate fauna from the interglacial deposits at Sugworth, near Oxford. *Philosophical Transactions of the Royal Society of London*, B289, 87–97.
- Stuart, A.J. (1981) A comparison of the middle Pleistocene mammal faunas of Voigtstedt (Thüringia, German Democratic Republic) and West Runton (Norfolk, England), *Quartärpaläeontologie, Berlin*, 4, 155–63.
- Stuart, A.J. (1982a) Pleistocene Vertebrates of the British Isles, Longman, London, 212 pp.
- Stuart, A.J. (1982b) Pleistocene occurrences of hippopotamus in Britain. *Quartärpaläeontologie, Berlin*, 6, 209–18.
- Stuart, A.J. (1988) Preglacial Pleistocene vertebrate faunas in East Anglia. In *Pliocene-Middle Pleistocene of East Anglia* (eds P.L. Gibbard and J.A. Zalasiewicz), Field Guide, Quaternary Research Association, Cambridge, pp. 57–64.
- Stuart, A.J. (1991) Mammalian extinctions in the Late Pleistocene of northern Eurasia and North America. *Biological Reviews*, 66, 453–562.
- Stuart, A.J. and West, R.G. (1976) Late Cromerian fauna and flora at Ostend, Norfolk. *Geological Magazine*, 113, 469–73.
- Sturdy, R.G., Allen, R.H., Bullock, P., et al. (1978) Palaeosols developed on Chalky Boulder Clay. Journal of Soil Science, 30, 117–37.
- Sumbler, M.G. (1983a) A new look at the type Wolstonian glacial deposits of Central England. *Proceedings of the Geologists' Association*, 94, 23–31.
- Sumbler, M.G. (1983b) The type Wolstonian sequence some further comments. *Quater-*

nary Newsletter, 40, 36-9.

- Sutcliffe, A.J. (1960) Joint Mitnor Cave, Buckfastleigh. *Transactions of the Torquay Natural History Society*, **13**, 1–26.
- Sutcliffe, A.J. (1964) The mammalian fauna. In The Swanscombe Skull: a Survey of Research on a Pleistocene Site (ed. C.D. Ovey), Royal Anthropological Institute, Occasional Paper No. 20, pp. 85–111.
- Sutcliffe, A.J. (1974) The caves of south Devon. In *Exeter Field Guide* (ed. A. Straw), Quaternary Research Association, Cambridge, pp. 8–10.
- Sutcliffe, A.J. (1975) A hazard in the interpretation of glacial-interglacial sequences. *Quaternary Newsletter*, 17, 1–3.
- Sutcliffe, A.J. (1976) The British glacial-interglacial sequence: a reply. *Quaternary Newsletter*, 18, 1–7.
- Sutcliffe, A.J. (1985) On the Track of Ice Age Mammals, British Museum (Natural History), London, 224 pp.
- Sutcliffe, A.J. and Bowen, D.Q. (1973) Preliminary report on excavations in Minchin Hole, April–May 1973. *Newsletter of the William Pengelly Cave Studies Trust*, **21**, 12–25.
- Sutcliffe, A.J. and Kowalski, K. (1976) Pleistocene rodents of the British Isles. Bulletin of the British Museum of Natural History (Geology), 27, 33–147.
- Sutcliffe, A.J., Currant, A.P. and Oakley, K.P. (1979) Some little known and potentially important Middle and Upper Pleistocene mammalian localities in Essex. *Quaternary Newsletter*, 29, 5–12.
- Swanscombe Committee (1938) Report on the Swanscombe skull. *Journal of the Royal Anthropological Institute*, **68**, 17–98.
- Szabo, B.J. and Collins, D. (1975) Ages of fossil bones from British interglacial sites. *Nature*, *London*, 254, 680–2.
- Tester, P.J. (1951) Palaeolithic flint implements from Bowman's Lodge Gravel Pit, Dartford Heath. Archaeologia Cantiana, 63, 122–34.
- Tester, P.J. (1953) The discovery of Acheulian implements in the deposits of the Dartford Heath terrace. *Archaeologia Cantiana*, 66, 72-6.
- Tester, P.J. (1955) Destruction of Rickson's Pit, Swanscombe. *Archaeologia Cantiana*, 69, 216–7.
- Tester, P.J. (1958) The age of the Baker's Hole industry. *Archaeological Newsletter*, 6, 123–5.

- Tester, P.J. (1975) Further consideration of the Bowman's Lodge industry. *Archaeologia Cantiana*, **91**, 29–39.
- Thomas, M.F. (1961) River terraces and drainage development in the Reading area. *Proceedings of the Geologists' Association*, 72, 415–36.
- Tomlinson, M.E. (1929) The drifts of the Stour-Evenlode watershed and their extension into the valleys of the Warwickshire Stour and Upper Evenlode. *Proceedings of the Birmingbam Natural History and Philosophical Society*, **15**, 157–96.
- Tomlinson, M.E. (1963) The Pleistocene chronology of the Midlands. Proceedings of the Geologists' Association, 74, 187–202.
- Treacher, L. (1896) Palaeolithic Man in east Berkshire. Berks., Bucks. and Oxon. Archaeological Journal, New Series, 2, 16–8 and 39–43.
- Treacher, L. (1904) On the occurrence of stone implements in the Thames valley between Reading and Maidenhead. *Man*, 4, 17–20.
- Treacher, L. (1909) Excursion to Maidenhead. Proceedings of the Geologists' Association, 21, 198–201.
- Treacher, L. (1916) Excursion to Bourne End. Proceedings of the Geologists' Association, 27, 107–9.
- Treacher, L. (1926) Excursion to Shiplake. Proceedings of the Geologists' Association, 37, 440-1.
- Treacher, L. (1934) Field meeting in the Marlow district. *Proceedings of the Geologists'* Association, 45, 107–8.
- Treacher, M.S., Arkell, W.J. and Oakley, K.P. (1948) On the ancient channel between Caversham and Henley, Oxfordshire, and its contained flint implements. *Proceedings of the Prebistoric Society*, 14, 126–54.
- Trimmer, J. (1853) On the origin of the soils which cover the Chalk of Kent. Part 3. Quarterly Journal of the Geological Society of London, 9, 286–96.
- Trimmer, W.K. (1813) An account of some organic remains found near Brentford, Middlesex. *Philosophical Transactions of the Royal Society of London*, **53**, 131–7.
- Tucker, E.V. and Greensmith, J.T. (1973) South East Essex. A. East Mersea. In *The Estuarine Region of Suffolk and Essex* (eds J.T. Greensmith, R.G. Blezard, C.R. Bristow, *et al.*), Geologists' Association Guide 12, pp. 12–7.

Turner, C. (1970) The Middle Pleistocene

deposits at Marks Tey, Essex. *Philosophical Transactions of the Royal Society of London*, **B257**, 373–440.

- Turner, C. (1973) Eastern England. In A Correlation of Quaternary Deposits in the Britisb Isles (eds G.F. Mitchell, L.F. Penny, F.W. Shotton and R.G. West), Geological Society of London Special Report, No.4, pp. 8–18.
- Turner, C. (1975) The correlation and duration of the Middle Pleistocene interglacial periods in North-west Europe. In After the Australopithecines: Stratigraphy, Ecology and Culture Change in the Middle Pleistocene (eds K.W. Butzer and G.L. Isaac), Mouton, The Hague, pp. 259–308.
- Turner, C. (1983) Nettlebed interglacial deposits. In *Diversion of the Thames* (ed. J. Rose), Field Guide, Quaternary Research Association, Cambridge, pp. 66–8.
- Turner, C. (1985) Problems and pitfalls in the application of palynology to Pleistocene archaeological sites in western Europe. In *Palynologie Archéologique* (eds J. Renault-Miskovsky, Bui-Thi-Mai and M. Girard), Actes des Journées du 25-26-27 janvier 1984, Éditions du Centre National de la Recherche Scientifique, Paris, pp. 347–73.
- Turner, C. and Kerney, M.P. (1971) The age of the freshwater beds of the Clacton Channel. *Journal of the Geological Society of London*, 127, 87–93.
- Tyldesley, J.A. (1986a) The Wolvercote Channel handaxe assemblage: a comparative study. *British Archaeological Report, British Series*, **153**, 211 pp.
- Tyldesley, J.A. (1986b) A re-assessment of the handaxe assemblage recovered from the Wolvercote Channel, Oxford. In *Recent Studies in the Palaeolithic of Britain and its Nearest Neighbours* (ed. S.N. Collcutt), J.R. Collis Publications, Department of Archaeology and Prehistory, Sheffield University, pp. 23–5.
- Tyldesley, J.A. (1988) Quartzite implements recovered from the Wolvercote Channel, Oxfordshire. *In* Non-flint stone tools and the Palaeolithic occupation of Britain (eds R.J. MacRae and N. Moloney), *British Archaeological Report, British Series*, **189**, 159–66.
- Tylor, A. (1869) On Quaternary gravels. Quarterly Journal of the Geological Society of London, 25, 57–100.
- Underwood, W. (1913) A discovery of Pleisto-

cene bones and flint implements in a gravel pit at Dovercourt, Essex. *Proceedings of the Prehistoric Society of East Anglia*, 1, 360–8.

- Vallois, H.V. (1954) Neandertals and Praesapiens. Journal of the Royal Anthropological Institute, 84, 111–30.
- Vallois, H.V. (1958) La Grotte de Fontécherade: Part 2, Anthropologie. Archives de l'Institut de Palaéontologie Humaine, Paris, Memoire No. 29, pp. 157–64.
- Waechter, J. d'A (1969) Swanscombe 1968. Proceedings of the Royal Anthropological Institute [for 1968], pp. 53–8.
- Waechter, J. d'A. (1970) Swanscombe 1969. Proceedings of the Royal Anthropological Institute [for 1969], pp. 83–5.
- Waechter, J. d'A. (1971) Swanscombe 1970. Proceedings of the Royal Anthropological Institute [for 1970], pp. 43–9.
- Waechter, J. d'A. (1972) Swanscombe 1971. Proceedings of the Royal Anthropological Institute [for 1971], pp. 73–8.
- Waechter, J. d'A. (1973) The Late Middle Acheulian industries in the Swanscombe area. In Archaeological Theory and Practice (ed. D.E. Strong), Seminar Press, London and New York, pp. 67–86.
- Walder, P.S. (1967) The composition of the Thames gravels near Reading, Berkshire. *Proceedings of the Geologists' Association*, 78, 107–19.
- Walker, H. (1871) On the glacial drifts of North London. Proceedings of the Geologists' Association, 2, 289–93.
- Ward, G.R. (1984) Interglacial fossils from Upminster, Essex. London Naturalist, 3, 24–6.
- Warren, S.H. (1911) Palaeolithic wooden spear from Clacton. Quarterly Journal of the Geological Society of London, 67, cxix.
- Warren, S.H. (1912) Palaeolithic remains from Clacton-on-Sea, Essex. Essex Naturalist, 17, 15.
- Warren, S.H. (1917) The study of pre-history in Essex as recorded in the publications of the Essex Field Club. *Essex Naturalist*, **18**, 145–52.
- Warren, S.H. (1922) The Mesvinian industry of Clacton-on-Sea. Proceedings of the Prebistoric Society of East Anglia, 3, 597–602.
- Warren, S.H. (1923a) The Elephas-antiquus bed of Clacton-on-Sea (Essex) and its flora and fauna. Quarterly Journal of the Geological Society of London, 79, 606–36.

Warren, S.H. (1923b) The sub-soil flint flaking

sites at Grays. Proceedings of the Geologists' Association, 34, 38–42.

- Warren, S.H. (1923c) Sub-soil pressure flaking. Proceedings of the Geologists' Association, 34, 153–75.
- Warren, S.H. (1924a) Pleistocene classifications. Proceedings of the Geologists' Association, 35, 265–82.
- Warren, S.H. (1924b) The elephant-bed of Clacton-on-Sea. Essex Naturalist, 21, 32–40.
- Warren, S.H. (1926) The classification of the Lower Palaeolithic with especial reference to Essex. South East Naturalist, 31, 38–50.
- Warren, S.H. (1933) The Palaeolithic industries of the Clacton and Dovercourt districts. *Essex Naturalist*, 24, 1–29.
- Warren, S.H. (1940) Geological and prehistoric traps. *Essex Naturalist*, 27, 2–19.
- Warren, S.H. (1942) The drifts of south-western Essex. Parts I and II. Essex Naturalist, 27, 154–79.
- Warren, S.H. (1945) Some geological and prehistoric records on the north-west border of Essex. *Essex Naturalist*, 27, 273–80.
- Warren, S.H. (1951) The Clacton flint industry: a new interpretation. Proceedings of the Geologists' Association, 62, 107–35.
- Warren, S.H. (1955) The Clacton (Essex) channel deposits. Quarterly Journal of the Geological Society of London, 111, 283–307.
- Warren, S.H. (1957) On the early pebble gravels of the Thames Basin from the Hertfordshire-Essex border to Clacton-on-Sea. *Geological Magazine*, 94, 40–6.
- Warren, S.H. (1958) The Clacton flint industry: A supplementary note. *Proceedings of the Geologists' Association*, 69, 123–9.
- Webb, W.M. (1894) Museum notes: Pleistocene non-marine Mollusca from Walton-on-the-Naze. Essex Naturalist, 8, 160–2.
- Webb, W.M. (1900) Pleistocene non-marine Mollusca from Clacton-on-Sea, Essex. Essex Naturalist, 11, 225–9.
- Wehmiller, J.F. (1982) A review of amino acid racemization studies in Quaternary molluscs: stratigraphic and chronological applications in coastal and interglacial sites. Pacific and Atlantic coasts, United States, United Kingdom, Baffin Island and tropical islands. *Quaternary Science Reviews*, 1, 83–120.
- Weidenreich, F. (1940) The *torus occipitalis* and related structures and their transformations in the course of human evolution. *Bulletin of*

the Geological Society of China, 19, 480–558.

- Weidenreich, F. (1943) The skull of Sinantbropus pekinensis: a comparative study on a primitive hominid skull. Palaeontologia Sinica, New Series D, 10, 1–485.
- Weiner, J.S. and Campbell, B.G. (1964) The taxonomic status of the Swanscombe skull. In *The Swanscombe Skull: a Survey of Research on a Pleistocene Site* (ed. C.D. Ovey), Royal Anthropological Institute, Occasional Paper No. 20, pp. 175–209.
- Weir, A.H., Catt, J.A. and Madgett, P.A. (1971) Postglacial soil formation in the loess of Pegwell Bay, Kent (England), *Geoderma*, **5**, 131–49.
- Wenban-Smith, F.F. (1990) The location of Baker's Hole. Proceedings of the Prehistoric Society, 56, 11–14.
- West, R.G. (1956) The Quaternary deposits at Hoxne, Suffolk. *Philosophical Transactions* of the Royal Society of London, **B239**, 265–356.
- West, R.G. (1963) Problems of the British Quaternary. *Proceedings of the Geologists' Association*, 74, 147–86.
- West, R.G. (1968) *Pleistocene Geology and Biology*, 1st edn, Longman, London, 379 pp.
- West, R.G. (1969) Pollen analyses from interglacial deposits at Aveley and Grays, Essex. *Proceedings of the Geologists' Association*, **80**, 271–82.
- West, R.G. (1972) Relative land-sea-level changes in south eastern England during the Pleistocene. *Philosophical Transactions* of the Royal Society of London, A272, 87–98.
- West, R.G. (1977) *Pleistocene Geology and Biology*, 2nd edn, Longman, London, 440 pp.
- West, R.G. (1980) *The Pre-glacial Pleistocene of the Norfolk and Suffolk Coasts*, Cambridge University Press, 203 pp.
- West, R.G. (1988) The record of the cold stages. *Philosophical Transactions of the Royal Society of London*, **B318**, 505–22.
- West, R.G. and Donner, J.J. (1956) The glaciations of East Anglia and the East Midlands: a differentiation based on stone orientation measurements of the tills. *Quarterly Journal* of the Geological Society of London, 112, 69–91.
- West, R.G., Lambert, C.A. and Sparks, B.W. (1964) Interglacial deposits at Ilford, Essex.

Philosophical Transactions of the Royal Society of London, B247, 185–212.

- West, R.G., Dickson, C.A., Catt, J.A., et al. (1974) Late Pleistocene deposits at Wretton, Norfolk. II. Devensian deposits. *Philosophical Transactions of the Royal Society of London*, B267, 337–420.
- Whitaker, W. (1862) On the western end of the London Basin; on the westerly thinning of the Lower Eocene beds in that basin; and of the Grey Wethers of Wiltshire. *Quarterly Journal of the Geological Society of London*, 18, 258–74.
- Whitaker, W. (1864) The Geology of Parts of Middlesex, Hertfordshire, Buckinghamshire, Berkshire and Surrey, Memoir of the Geological Survey of Great Britain, 112 pp.
- Whitaker, W. (1875) *Guide to the Geology of London and the Neighbourbood*, Memoir of the Geological Survey of Great Britain, 72 pp.
- Whitaker, W. (1877) *The Geology of the Eastern End of Essex*. Memoir of the Geological Survey of Great Britain, 32 pp.
- Whitaker, W. (1884) *Guide to the Geology of London and the Neighbourhood*, 4th edn, Memoir of the Geological Survey of Great Britain, 98 pp.
- Whitaker, W. (1889) *The Geology of London and Parts of the Thames Valley*, Volume 1, Memoir of the Geological Survey of Great Britain, 556 pp.
- White, H.J.O. (1892) Notes on the Westleton Beds near Henley-on-Thames. *Proceedings of the Geologists' Association*, **12**, 379–84.
- White, H.J.O. (1895) On the distribution and relations of the Westleton and glacial gravels in Oxfordshire and Berkshire. *Proceedings of the Geologists' Association*, 14, 11–23.
- White, H.J.O. (1897) On the origin of the high-level gravel with Triassic debris adjoining the valley of the Upper Thames. *Proceedings of the Geologists' Association*, **15**, 157–74.
- White, H.J.O. (1902) On the peculiarity in the course of certain streams in the London and Hampshire Basins. *Proceedings of the Geologists' Association*, **17**, 399–413.
- White, H.J.O. (1906) On the occurrence of quartzose gravel in the Reading Beds at Lane End, Bucks. *Proceedings of the Geologists' Association*, **19**, 371–7.
- White, H.J.O. (1907) The Geology of the Country around Hungerford and Newbury. Memoir

of the Geological Survey of Great Britain, 150 pp.

- White, H.J.O. (1908a) Eocene. In *The Geology of the Country around Henley on Thames and Wallingford* (eds A.J. Jukes-Browne and H.J.O. White), Memoir of the Geological Survey of Great Britain, pp. 58–76.
- White, H.J.O. (1908b) Scenery and superficial deposits. In *The Geology of the Country around Henley on Thames and Wallingford* (eds A.J. Jukes-Browne and H.J.O. White), Memoir of the Geological Survey of Great Britain, pp. 77–103.
- Whiteman, C.A. (1983) Great Waltham. In *Diversion of the Thames* (ed. J. Rose), Field guide, Quaternary Research Association, Cambridge, pp. 163–9.
- Whiteman, C.A. (1987) Till lithology and genesis near the southern margin of the Anglian ice sheet in Essex, England. In *Tills and Glaciotectonics* (ed. J.J.M. Van der Meer), A.A. Balkema, Rotterdam, pp. 55–66.
- Whiteman, C.A. (1990) Early and Middle Pleistocene stratigraphy and soils in central Essex, England. Unpublished Ph.D. thesis, University of London.
- Whiteman, C.A. and Kemp, R.A. (1990) Pleistocene sediments, soils and landscape evolution at Stebbing, Essex. *Journal of Quaternary Science*, **5**, 145–61.
- Wiegank, K. Von.F. (1972) Ekologische Analyse quartärer Foraminiferen. *Geologie* 21, 7, 1–111.
- Wilson, D. and Lake, R.D. (1983) Field meeting to north Essex and west Suffolk, 20–22 June, 1980. Proceedings of the Geologists' Association, 94, 75–9.
- Wiseman, C.R. (1978) A palaeoenvironmental reconstruction of part of the Lower Thames terrace sequence based on sedimentological studies from Aveley, Essex. Unpublished M.Sc. thesis, City of London Polytechnic and Polytechnic of North London.
- Wolpoff, M.H. (1971) Is Vértessozöllös an occipital of *Homo erectus*? *Nature*, *London*, 232, 867–8.
- Wood, S.V. (1848) Introduction, v-xii. In A Monograph of the Crag Mollusca, or Descriptions of Shells from the Middle and Upper Tertiaries of the East of England, Part 1 Univalves (S.V. Wood), Monograph of the Palaeontographical Society, London, 208 pp.
- Wood, S.V., Jun. (1866a) On the structure of the Thames valley and its contained deposits. I

and II. Geological Magazine, 3, 57-63 and 99-107.

- Wood, S.V., Jun. (1866b) On the structure of the valleys of the Blackwater and the Crouch and of the East Essex Gravel, and on the relation of this gravel to the denudation of the Weald. *Geological Magazine*, **3**, 348–54 and 398–406.
- Wood, S.V., Jun. (1867) On the structure of the Postglacial deposits of the south-east of England. Quarterly Journal of the Geological Society of London, 23, 394–417.
- Wood, S.V., Jun. (1868) On the pebble-beds of Middlesex, Essex and Herts. Quarterly Journal of the Geological Society of London, 24, 464–72.
- Wood, S.V., Jun. (1870) Observations on the sequence of the glacial beds. *Geological Magazine*, 7, 17–22 and 61–8.
- Wood, S.V., Jun. (1872) On the climate of the Post-Glacial Period. *Geological Magazine*, 9, 153–61.
- Wood, S.V., Jun. and Harmer, F.W. (1868) On the Glacial and Post-Glacial structure of Norfolk and Suffolk. *Geological Magazine*, 5, 452.
- Wood, S.V., Jun. and Harmer, F.W. (1872) An outline of the geology of the Upper Tertiaries of East Anglia. *In* Supplement to the Monograph of the Crag Mollusca (ed. S.V. Wood), *Monograph of the Palaeontolographical Society*, 3, 2–31.
- Woodland, A.W. (1970) The buried tunnelvalleys of East Anglia. Proceedings of the Yorkshire Geological Society, 37, 521–78.
- Woodward, B.B. (1890) On the Pleistocene (non-marine) Mollusca of the London district. Proceedings of the Geologists' Association, 11, 335–87.
- Woodward, H.B. (1904) Excursion to Upminster, Great Warley and Brentwood. Proceedings of the Geologists' Association, 18, 479–86.
- Woodward, H.B. (1909) *The Geology of the London District*, 1st edn, Memoir of the Geological Survey of Great Britain, 142 pp.
- Woodward, H.B. and Davies, W. (1874) Note on the Pleistocene deposits yielding mammalian remains in the vicinity of Ilford, Essex. *Geological Magazine*, 1, 390–8.
- Woodward, H.B., Bromehead, C.E.N. and Chatwin, C.P. (1922) *The Geology of the London District*, 2nd edn, Memoir of the Geological Survey of Great Britain, 99 pp.

417

- Wooldridge, S.W. (1927a) The Pliocene history of the London Basin. *Proceedings of the Geologists' Association*, **38**, 49–132.
- Wooldridge, S.W. (1927b) The Pliocene Period in western Essex and the Pre-glacial topography of the district. *Essex Naturalist*, **21**, 247–68.
- Wooldridge, S.W. (1928) The 200-foot platform in the London Basin. *Proceedings of the Geologists' Association*, 39, 1–26.
- Wooldridge, S.W. (1938) The glaciation of the London Basin, and the evolution of the Lower Thames drainage system. *Quarterly Journal of the Geological Society of London*, 94, 627–64.
- Wooldridge, S.W. (1957) Some aspects of the physiography of the Thames valley in relation to the Ice Age and early Man. *Proceedings of the Prebistoric Society*, 23, 1–19.
- Wooldridge, S.W. (1960) The Pleistocene succession in the London Basin. Proceedings of the Geologists' Association, 71, 113–29.
- Wooldridge, S.W. and Ewing, C.J.C. (1935) The Eocene and Pleistocene deposits of Lane End, Bucks. *Quarterly Journal of the Geological Society of London*, 41, 293–317.
- Wooldridge, S.W. and Gill, D.M.C. (1925) The Reading Beds of Lane End, Bucks., and their bearing on some unsolved questions of London geology. *Proceedings of the Geologists' Association*, 36, 146–73.
- Wooldridge, S.W. and Henderson, H.C.K. (1955) Some aspects of the physiography of the eastern part of the London Basin. *Transactions of the Institute of British Geographers*, 21, 19–31.
- Wooldridge, S.W. and Linton, D.L. (1939) Structure, Surface and Drainage in South-east England. Transactions of the Institute of British Geographers, No. 10, 124 pp.
- Wooldridge, S.W. and Linton, D.L. (1955) Structure, Surface and Drainage in Southeast England, 2nd edn, G. Phillip, London, 176 pp.
- Wright, W.B. (1937) *The Quaternary Ice Age*, Macmillan, London, 478 pp.
- Wymer, B.O. (1955) The discovery of the right pariental bone at Swanscombe. *Man*, 55, 124.
- Wymer, J.J. (1956) Palaeoliths from the gravel of the Ancient Channel between Caversham and Henley at Highlands, near Henley. *Proceedings of the Prehistoric Society*, 22, 29–36.

- Wymer, J.J. (1957) A Clactonian flint industry at Little Thurrock, Grays, Essex. Proceedings of the Geologists' Association, 68, 159–77.
- Wymer, J.J. (1958) Archaeological notes from Reading Museum: Highlands, Henley. Berkshire Archaeological Journal, 56, 56–7.
- Wymer, J.J. (1959) Archaeological notes from the Reading Museum: Henley. *Berkshire Archaeological Journal*, **57**, 121–2.
- Wymer, J.J. (1960) Archaeological notes from the Reading Museum: Henley. *Berksbire Archaeological Journal*, **58**, 52–8.
- Wymer, J.J. (1961) The Lower Palaeolithic succession in the Thames valley and the date of the Ancient Channel between Caversham and Henley, Oxfordshire. *Proceedings of the Prebistoric Society*, **27**, 1–27.
- Wymer, J.J. (1962) Archaeological notes from the Reading Museum: Rotherfield Peppard, Oxon. *Berkshire Archaeological Journal*, 60, 114–5.
- Wymer, J.J. (1964a) Archaeological notes from the Reading Museum: Rotherfield Peppard, Oxon. Berkshire Archaeological Journal, 61, 96–7.
- Wymer, J.J. (1964b) Excavations at Barnfield Pit, 1955–1960. In *The Swanscombe Skull: a Survey of Research on a Pleistocene Site* (ed. C.D. Ovey), Royal Anthropological Institute, Occasional Paper No. 20, pp. 19–60.
- Wymer, J.J. (1968) Lower Palaeolithic Archaeology in Britain, as Represented by the Thames Valley, John Baker, London, 429 pp.
- Wymer, J.J. (1974) Clactonian and Acheulian industries in Britain – their chronology and significance. *Proceedings of the Geologists'* Association, 85, 391–421.
- Wymer, J.J. (1976) Highlands Farm Pit, Rotherfield Peppard. In *Field Guide to the Oxford Region* (ed. D.A. Roe), Quaternary Research Association, Oxford, pp. 48–9.
- Wymer, J.J. (1977a) Highlands Farm, Rotherfield Peppard. In South East England and the Thames Valley (eds E.R. Shephard-Thorn and J.J. Wymer), Guide Book for excursion A5, X INQUA Congress, Birmingham, Geoabstracts, Norwich, pp. 24–8.
- Wymer, J.J. (1977b) Sulhamstead. In *South East England and the Thames Valley* (eds E.R. Shephard-Thorn and J.J. Wymer), Guide Book for excursion A5, X INQUA Congress, Birmingham, Geoabstracts, Norwich, pp. 11–2.

- Wymer, J.J. (1977c) Furze Platt. In South East England and the Thames Valley (eds E.R. Shephard-Thorn and J.J. Wymer), Guide Book for excursion A5, X INQUA Congress, Birmingham, Geoabstracts, Norwich, pp. 30–4.
- Wymer, J.J. (1981) The Palaeolithic. In *The Environment in British Prehistory* (eds I.G. Simmons and M.J. Tooley), Duckworth, pp. 49-81.
- Wymer, J.J. (1985a) Early Man in Britain time and change. *Modern Geology*, 9, 261–72.
- Wymer, J.J. (1985b) *The Palaeolithic Sites of East Anglia*, Geobooks, Norwich, 440 pp.
- Wymer, J.J. (1988) Palaeolithic archaeology and the British Quaternary sequence. *Quaternary Science Reviews*, 7, 79–98.
- Wymer, J.J. and Singer, R. (1970) The first season of excavations at Clacton-on-Sea, Essex, England: a brief report. *World Archaeology*, **2**, 12–16.
- Zagwijn, W.H. (1973) Pollen analytic studies of Holsteinian and Saalian Beds in the northern Netherlands. *Mededelingen Rijks Geologische Dienst, New Series*, 24, 139–56.
- Zagwijn, W.H. (1978) A macroflora of Holsteinian age from the northern part of the Netherlands. *Review of Paleobotany and Palynology*, 26, 243–8.
- Zagwijn, W.H. (1985) An outline of the Quaternary Stratigraphy of the Netherlands. *Geologie en Mijnbouw*, **50**, 41–58.
- Zagwijn, W.H. (1986) The Pleistocene of the Netherlands with special reference to glacia-

tion and terrace formation. *Quaternary Science Reviews*, **5**, 341–6.

- Zagwijn, W.H., Montfrans, H.M. Van and Zandrsta, J.G. (1971) Subdivision of the 'Cromerian' in the Netherlands; pollen analysis, palaeomagnetism and sedimentary petrology. *Geologie en Mijnbouw*, **50**, 41–58.
- Zalasiewicz, J.A. and Gibbard, P.L. (1988) The Pliocene to early Middle Pleistocene of East Anglia: an overview. In *Pliocene–Middle Pleistocene of East Anglia* (eds P.L. Gibbard and J.A. Zalasiewicz), Field Guide, Quaternary Research Association, Cambridge, pp. 1–31.
- Zeuner, F.E. (1945) *The Pleistocene Period: its Climate, Chronology and Faunal Successions*, 1st edn, Ray Society, Publication No. 130, London, 322 pp.
- Zeuner, F.E. (1946) Dating the Past: an Introduction to Geochronology. Methuen, London, 444 pp.
- Zeuner, F.E. (1954) Riss or Würm? *Eiszeitalter* und Gegenwart, 4, 98–105.
- Zeuner, F.E. (1955) Loess and Palaeolithic chronology. *Proceedings of the Prehistoric Society*, **21**, 51–64.
- Zeuner, F.E. (1958) *Dating the Past: An Introduction to Geochronology*, 4th edn, Methuen, London, 516 pp.
- Zeuner, F.E. (1959) The Pleistocene Period: its Climate, Chronology and Faunal Successions, 2nd edn, Hutchinson, London, 447 pp.

Areleada conthana Mr. 17.46.

### Index

Page numbers in **bold** type refer to figures and page numbers in *italic* type refer to tables.

Abbevillian culture/artefacts 26, 56, 143, 150, 342 Abies 74, 334, 352 Acheulian Industry 26, 74, 150, 189, 190, 361 Early 56, 143, 150, 342 Ingress Vale shell bed 210 Middle 156, 222 Purfleet 225 Swanscombe 206-7, 211 see also hand-axes Aggradation 20 in cold episodes 116 during interglacials 18, 226 in response to climatic deterioration 17 of sands and gravels 19 Alkerden Lane Allotments SSSI 194, 195, 217 Alluvium, estuarine and marine 18 Amino acid ratios/ geochronology 12, 13, 28, 74, 79, 127, 228, 235 Aveley interglacial beds 261, 262 Clacton 311, 340 Grays 235 Hoxne 311 Ilford 261 Little Oakley 311-12 Mucking Formation 250 Noordbergum 312 Northfleet 274 post-Anglian sediments 176

Purfleet deposits 226 Stanton Harcourt 74 Sugworth 47-8 Swanscombe 214, 311 West Runton 311 'Ancient Channel' 27, 84, 141-5, 147, 216 Palaeolithic artefacts 142-3 'Ancient Channel Gravel' 147 **Black Park Formation** correlation 144 controversy over age and origin of 143-4 Anglian ice sheet maximum extent, SE Essex 292 southern limit 176, 185 Anglian Stage 5, 10, 42, 44, 48, 157, 175, 287, 368 and Cotswolds glaciation 40 early, aeolian activity 296 glacial advances during 27, 29, 114, 297 glacial deposits 27, 29 glaciation 7, 17-18, 19, 20, 113-14, 138, 214 of Vale of St Albans 47, 121-38, 135 Oxygen Isotope Stage 12, 13, 21 Anglian-Elsterian correlation 15, 16 Animal footprints 200, 201 Anotylus gibbulus 73, 261

Arctic Brown Soil 291 Ardleigh Gravel Formation 285, 286, 287, 288, 289, 292, 299, 300, 305-6 Ardleigh interglacial deposits 17, 287, 299, 300, 300, 302, 303, 304 relations with Little Oakley channel-fill 302 Ardleigh Lower Gravel Member 289, 300, 300 Ardleigh (Martells Quarry) 299-305 Ardleigh Upper Gravel Member 289, 299, 300, 300, 303 Ardleigh/Oakley Gravel Formation 24, 287, 314, 316, 329 Artefacts as markers 26 see also Palaeolithic artefacts Arvicola cantiana 16, 17, 46, 208, 272, 276, 316 Arvicola terrestris 355, 370 Asheldham Channel 294, 345, 346, 356, 357-62, 358 Asheldham Channel Gravel 361.362 correlation with Lower **Clacton Freshwater Beds** 361 correlation with Swanscombe Lower Gravel 361 Asheldham Channel interglacial deposits 361

#### Index

Asheldham Gravel Formation 329, 329, 357, 358, 361, 362 Low-level East Essex Gravel affinity 361 see also Southchurch Gravel Formation Asheldham Gravel/Mersea Island/Wigborough Gravel Formation 345, 355 Asheldham Terrace 361 Ashingdon Gravel Formation 289, 292, 323, 327 Aveley (Sandy Lane Quarry) deposits 78, 174, 249, 251-61, 273, 274 alternative stratigraphical positions 251-2 correlation with sediments outside Lower Thames 260 Azolla filiculoides 335 **Baginton Gravel 25 Baginton Sand 25 Bagley Wood Channel 42 Bagshot Beds 326** Baker's Farm, Levallois material 156 Baker's Hole see Northfleet (Ebbsfleet valley): Baker's Hole complex Baker's Hole industry 270, 271-2 'Baker's Hole or Main Coombe Rock' Stage 271 **Barham Sands and Gravels** 282, 283, 290, 296 Barham Soil 21, 204, 283, 290, 293, 296, 299, 315 associated disruptions 295 cryoturbation features 293 represents final modification of Valley Farm Soil 295, 295-6 Barling Gravel Formation 294, 328, 329, 330, 356, 361 **Barling/Dammer Wick Gravel** 322, 327, 361 'Barnet Gate Type' pebbly gravel 89, 103 Barnfield Pit, Swanscombe 193-218

correlation with other Thames system sites 210-13 **Barvills Gravel 235 Base levels** Devensian, low 376 fluvial, lowering of 18 Baventian Stage 10, 16 Baylham Common Gravel 24, 284 **Beaconsfield Gravel Formation** 5, 24, 84-5, 86, 90-1, 94, 100, 112 Bed I (at Clacton) 332-3, 335 Bedding/stratification cross-bedding/current bedding/cross stratification 50, 59, 60, 72, 115, 122, 129, 130, 131, 133, 135, 136, 141, 158, 185-8, 186, 190, 199, 202-4, 209, 212, 220, 221, 240, 256, 263, 290, 315, 318, 343-4, 350, 353, 357, 359 tabular and trough 122, 123, 136 horizontal 102, 182, 197, 204, 240, 242, 247, 314 lenticular 200 planar 41, 187, 222, 350 Beenham Grange Terrace 90, 139, 141, 147, 169 Beestonian Stage 10, 16, 21, 283, 315 Beestonian-Menapian correlation 16 Beetle assemblages Ardleigh 299, 300 Aveley 261 Fern House gravel pit 161 Great Totham 383 see also Insect remains Belfairs Gravel Formation 292, 328, 329 Belfairs/Mayland Gravel Formation 289, 323, 327 Belhus Park 177, 227, 236, 260 'Bell Bar Group' 92 'Bell Bar type' pebbly gravel 89, 111, 115 Bellehatch Park 27, 84

Bembidion basti 383 **Binney Gravel 294 Biozones** (pollen) CrIb 310-11 CrIIb 310-11 CrIII 46, 47, 316 HoI 339 HoII 200, 208 HoIIb 335, 335, 339 HoIIIa 335, 335, 339, 355 HoIIIb 126, 208, 334, 335, 339, 355 IpIIb 256, 257 IpIII 74, 239, 247, 256, 258 Black Park 'bench' 184 **Black Park Gravel Formation** 1, 7, 8, 17-18, 19, 26, 28, 42, 47, 48, 56, 84-5, 86, 91, 100, 127, 128, 139, 139, 141, 145, 147, 184, 185, 191, 216-17, 329, 346, 361 Anglian age of 183 artefacts from 144 level of 191, 192, 193 see also Silchester Gravel; Smug Oak Gravel Black Park Terrace 5, 8, 133, 139, 144, 191 Blackwater deposits 279, 286, 327, 376 Blackwater, R. 8, 326, 328, 358, 363, 364, 369, 373-4, 375 channels 375 pre-Holocene marine transgression 376 Blackwater-Chelmer system First Terrace Gravel 369 Second Terrace 376, 385 Second Terrace Gravel 322, 369 Third Terrace 385 Blackwater-Loddon River 142 Blackwater-Loddon valleys 140 Bledlington Terrace 30, 38, 54 Bluelands Quarry (Pit) 206, 219, 220, 228 Palaeolithic assemblage 225 Botany (Chalk) Pit, Purfleet 219, 220, 223, 228 Palaeolithic artefacts 220 Bowmans Lodge industry 190

Boxgrove 16, 26, 63, 141, 144, 148, 316, 341, 343 'Boyn Hill bench' 182 'Boyn Hill Gravel' 173 Boyn Hill Gravel Formation 8, 29, 56, 84-5, 86, 90-1, 100, 139, 151, 152, 155, 155, 175, 184, 188, 191, 192, 230, 329, 346, 361, 368 Boyn Hill Terrace 8, 139, 139, 143, 178, 188, 191, 204, 214, 217 Boyn Hill terrace gravel 3 Boyn Hill/Mersea Island/ Wigborough Formation 346 Boyn Hill/Orsett Heath Gravel Formation 9, 180, 183, 192, 195, 212, 224, 229, 231, 233, 252 above till at Hornchurch 177 Braided (river) floodplain(s) 41, 353 Braided river(s) 52, 57, 71, 136, 147, 214, 290, 357-8 channels 145, 147 deposits/gravels 147, 212, 222 'Brain Valley Gravels' 281 'Braintree line' 341 **Brecciation 270** 'Brentwood Group' 102-3 Brickearth 140, 141, 150, 178, 348, 349, 359, 369 Aveley 255, 256, 258 Crayford 64, 249-50 Dartford Heath 187-8, 189 Ebbsfleet 166, 265, 268 Grays 230, 234, 237, 247 Little Thurrock 229, 230, 231 Purfleet 218, 223, 224 Tendring Plateau 285 West Thurrock 237, 238, 239, 240, 241, 242, 247, 251 age of 247-8 Bricket Wood 129 Brightlingsea Gravel 322 **Brimpton** deposits biostratigraphical subdivision 163-5 correlation with Taplow

Formation 28-9 opposing interpretations 169 Brimpton Gravel Pit 162-70 complex biostratigraphy 163-7 Brimpton Interstadial 162-3, 163 correlation with Odderade Interstadial 167 British Museum 190, 206, 246, 264, 266, 266-9, 268 **Broomfield** 17 Broomfield gravel, correlatives of 303 Bucklebury Stage, of Kennet 146 'Bunter quartzites' 104, 111 'Buried Channel' 249, 279, 376 **Buried channels** beneath Dartford area terrace sediments 192, 193 E Essex 18, 128, 192, 216, 235, 294, 330, 358, 361 and Low-level East Essex Gravel sequences 330 Buried soils 265, 277, 293, 296 **Kesgrave Group 249** Swanscombe Upper Loam 201, 203, 215, 233 see also Barham Soil; Valley Farm Soil Buried valley system 6 'Burnham buried Channel' 361 Burnham Channel 294, 358, 361 Caidge Gravel Formation 292, 329 see also Chalkwell Gravel Formation 'Cailloutis' 265 Calcrete 55 **Canewdon Gravel Formation** 292, 328, 329 Canewdon/St Lawrence Gravel 289. 323. 327 Cannoncourt Farm Pit 100,

Chalfont St Giles brick pit 114-17 Chalk 122-3, 266 pinnacled 118 in Ugley Gravel 136 **Chalkwell Gravel Formation** 292, 328, 329 Chalkwell/Caidge Gravel Formation 289, 319, 323, 327 'Chalky Boulder Clay' glaciation 5, 113, 131, 282 see also Anglian Stage, glaciation 'Chalky Till' Cotswolds 59, 63 deposited during single Anglian Stage glaciation 282 two separate glacial episodes? 282 W Midlands, age of 52, 56 Channels 'Ancient Channel' 27, 84, 141-5, 147, 216 Asheldham Channel 294, 347, 356, 357-62, 358 'Buried Channel' 249, 279, 376 Burnham Channel 294, 361 Channel iii-iv (of S.H. Warren) at Clacton 334, 335-6 Channel vi (of S.H. Warren) at Clacton 334, 335 Clacton Channel(s) 182, 214, 216, 229, 233, 285, 287, 294, 330-46, 331, 334, 335, 352, 355, 371-2 **Cudmore Grove Channel** 294, 347-57, 348, 350, 369-75 Dartford Heath, channels at 189-93 eastern Essex, (buried) channel systems 18, 128, 192, 216, 235, 294, 330, 358, 361 Ebbsfleet Channel 262-74

Cauliflower Pit, Ilford 257,

259, 261

423

149-57

Canvey Island 330

Cassington 36, 41, 50

Little Oakley, channel at 305-13, 307, 316, 318 see also Little Oakley Silts and Sands Lower Gravel Channel, Swanscombe 192, 196, 197, 216, 294, 345 Nettlebed, channel at 107-110 Rochford Channel 235, 328 Shoeburyness Channel 235, 294, 328, 361 Southend Channel 294, 328, 345, 356 Stanton Harcourt Channel 35, 37, 40, 64, 66-79, 69, 70, 77 Sugworth Channel 28, 35, 39, 41-9, 43, 44, 47 Wolvercote Channel 29, 35, 37, 40, 58, 58-65, 64, 74, 75 Channels/rivers, single-thread 41, 68, 306 Chelford Interstadial 162-3, 163, 167, 169, 385 Chelmer, R. 328, 363, 368 Chelmsford area, glacial deposits of 382-3 Chelmsford Gravels 281, 365, 366, 367 Chert Carboniferous 114, 283, 361 Greensand 91, 92, 104, 126, 142, 286, 309, 320, 321, 328, 344, 370, 374 Rhaxella 122-3, 136, 188, 210, 214, 299, 300, 300, 303, 320, 321, 328, 361, 363, 365, 373 Cherwell Valley 39, 49 Chillesford Beds 283 'Chiltern Drift' ice advance 5, 113 Chiltern high-level gravels, as **Reading Beds 96 Chilterns Pebble Gravel** Subgroup 94, 109 Chopper-cores see Palaeolithic cores **Chorleywood Gravel** Formation 94 Chorleywood Gravel/deposit 84, 91, 94, 99, 100, 112

Chronostratigraphical stages, Pleistocene 10 Clacton 6, 18, 21, 48, 279, 330-47 Clacton Channel 192, 214, 216, 229, 233, 285, 287, 294, 330-47, 331, 334, 352, 354, 371-2 deposits of 335 erosion of 182 from post-Wigborough Gravel rejuvenation 345 link to Lower Gravel Channel, Swanscombe 216 post-diversion Thames-Medway 332, 340 separate channel to seaward 335 see also Cudmore Grove Channel **Clacton Channel Deposits** 215, 233, 287, 330-47, 361, 371-2 correlation with Swanscombe 338, 347 inland outcrop 335-6 interpretation 337-46 Palaeolithic artefacts 337, 341-3 post-diversion 338 relations with Holland Gravel 344 research and descriptions 332-7 Clacton Channel Gravel 287, 322, 336, 345 reworked quartzose material 345 Clacton deposits, stratigraphical relations 343-7 Clacton Estuarine Beds 208, 333-7, 334, 335, 338-41, 345 differences, Jaywick and West Cliff 337 Clacton Freshwater Beds 333, 334 Clacton Golf Course 335-6 sediments differentiated 339, 340 'Clacton-on-Sea Stage' 214, 233

Clactonian Industry 26, 143, 150, 277, 330, 331, 337, 341-3, 361 age of 342 Burnham on Crouch 346 Clacton 342-3 cores and flakes 142 Highlands Pit Farm 142, 143 Little Thurrock 229, 231, 232, 233-4, 236, 247 Purfleet 222, 222, 225, 228 Swanscombe 197, 206, 210, 211-12 Clast-lithological data Essex gravels 288-9, 322-3 **Kesgrave Sands and Gravels** 283-4 Lower Thames 181 Middle Thames and Vale of St Albans 100-1 **Claydons Gravel Formation** 323, 327, 329 Claygate Beds 102, 326 Climatic cycles 31 between Cromerian and Anglian 16 Climatic fluctuations 30 correlated to terrace formation 20 and deposition of Kesgrave Sands and Gravels Group 295 and division of the Pleistocene 10 Middle Pleistocene 61 and Late Pleistocene 213 post-Anglian, severity of 25 recognized from oxygen isotope studies 12 since Anglian Stage 20 Clinch Street Gravel 292 Coelodonta antiquitatis 271 Colchester 5, 24 Cold Ash Stage, of Kennet 146 Cold climate episodes 18-29, 20, 52, 251, 260, 283 Anglian 129 Ardleigh 300, 303, 304 Boyn Hill Gravel 214 early Saalian 38 East Mersea 373, 374 Great Totham 384 **Kempton Park Formation** 161

Northfleet 266, 268, 269, 271, 274 Stanton Harcourt Channel deposits 40 Stanton Harcourt Gravel 68, 69, 70, 72 Summertown-Radley Formation 161-2 Swanscombe 198, 204, 213 **Taplow Formation** aggradation 159 Westmill Lower Gravel 124 see also glaciations Colne Basin 128 Colne, R. (Essex) 278, 285, 286, 292, 294, 313, 318, 335, 344-5, 349, 354, 363 Colne, R. (Middlesex) 84, 113, 114, 124, 127-9, 133, 134, 173, 189 Combe Formation 35, 36, 37, 38 **Combe Terrace** 47 **Compositional changes** between High- and Low-level East Essex Gravels, stratigraphical marker 329 within gravel formations 318, 344 **Cooks Green Gravel Formation** 285, 286, 288, 289, 292 see also Wivenhoe Gravel Formation Coombe deposits 218, 220 Coombe rock 224, 240, 247, 250, 265, 267, 269, 271 formation of 270 Cooper's Pit 152 Corbets Tey borehole 227 Corbets Tey Gravel Formation 26, 64, 174, 175, 176, 177, 181, 219, 223-4, 227, 228, 229, 231, 235, 257, 294, 356 correlation with Lynch Hill Gravel 174, 258 interglacial channel 361 see also Lynch Hill Gravel Formation Corbicula fluminalis 67, 68, 69, 74, 77, 226, 227, 234, 235, 236, 250, 272, 351, 361

absent from Ipswichian sensu Trafalgar Square 72-3 Summertown-Radley Formation 67 Corton Sands 280 Cotswolds glaciation 29, 30, 38, 52, 65 age of 39-40, 57 implied Saalian age 57 post-Oxygen Isotope Stage 12, 13 Coverloam 68 Coversand 280, 283, 289, 290, 291, 293, 296, 296 Cowcroft 98 Crayford deposits 14, 246 249-50, 261, 271, 274 Crayford industry 271 Craylands Lane Pit (Swanscombe) 212 Crays Pond 116 Crocidura 356 Crocidura cf. suaveolens 256 Cromer Forest Bed 316 Cromer Till 280 Cromer Till/North Sea Drift glaciation 282 'Cromerian Complex' 17, 42, 47, 107-8, 204, 299, 313, 321, 329 Interglacial I 17 Interglacial II 302, 303, 312 Interglacial III 303 Interglacial IV 312 Cromerian Stage 10, 16, 21, 37, 42, 44, 283 British, possibly missing in Netherlands 312 'late Cromerian' 314, 316 sensu lato 47-8, 311 sensu West Runton 16, 46, 305, 310 see also Little Oakley; Sugworth (Channel Deposits); Wivenhoe **Gravel Formation** (Interglacial Deposits) Crouch estuary 326, 329 Crouch gravel 327 Crouch, R. 8, 292, 294, 327 'Crouch Terraces 1-4' 326 **Crowsley Park 27** Crowsley Park Trench see 'Ancient Channel'

Croxley Green 112 Cryoturbation 60, 68, 141, 147, 148, 169, 204, 241, 265, 266, 271, 283, 291, 293, 299, 301, 304, 314, 316, 339, 344, 374 Cudmore Grove Channel 285, 294, 347-57, 348, 349, 350, 354, 369-75 problems with Clacton Channel correlation 354 Thames-Medway channel 375 **Cudmore Grove Channel** Deposits 349, 350, 352, 361 Hoxnian (sensu Swanscombe) age 354 **Cudmore Grove Channel** Gravel 350 Cudmore Grove (East Mersea) 337, 347-57, 369, 375 records change from fluvial to estuarine 353 see also East Mersea: Hippopotamus Site Cyprideis torosa 225, 227, 351, 371

Dagenham Farm Gravel 292 Dama dama clactoniana 207, 338 Dammer Wick Gravel Formation 294, 329 see also Barling Gravel Formation 'Danbury Gravels' 281 Danbury Hill 286 Darent channel (Pearson's Pit) 184 Darent, R. 187 and Swanscombe deposits 209-10 Dartford Heath, channels at 189-93 Dartford Heath Gravel 174, 177, 183, 184, 185, 187, 216 age controversy 187 early descriptions/ interpretations 187-9 Lower Thames sequence correlation controversies 191-3

as part of Boyn Hill/Orsett Heath Formation 192-3 relationship with Swanscombe deposits 212 see also Wansunt Pit **Daws Heath Gravel Formation** 189-90, 292, 323, 327, 329 Dean Grove 36, 50 Décollement plane, in till 296 Deformation glaciotectonic 293, 296, 298, 365 penecontemporaneous 353 Deformation structures 240, 242 'Deformation till', basal 293, 296, 298 Dengie Peninsula 278, 329, 345, 357 gravel formations 329 Desiccation levels, Swanscombe 200 Detritus mud 253, 254 Devensian Stage 41, 161, 162-3, 167, 169, 248, 252, 364, 373, 374, 375, 385 Early 29, 160 Diacheila polita 383 Diapirism 256, 293, 353, 365, 374 Dicerorbinus etruscus 46, 316 Dicerorbinus hemitoechus 50, 61, 67, 207, 238, 263, 270, 271, 333, 339, 370 Dierden's Pit, Ingress Vale 210-11, 214 Diestian 96-7, 106 Discus ruderatus 165 Diversion of Thames 5-6, 19, 126, 128, 129, 134, 216, 279, 283, 328, 363 from Ancient Channel 144 through glacial ponding 86, 124, 299 to modern valley 182, 183, 184, 323-4 Dix's Pit, Stanton Harcourt 68 **Dollis Hill Gravel Formation** 84-5, 94, 101 Downwarping 18 Draba incana L. 62

Early Middle Pleistocene. Thames drainage evolution 314-15 **Early Pleistocene** classification of 16 course of Thames 363 East Anglia extension of pre-diversion Thames system into 6 southern new stratigraphical scheme 282-3 recognition of early Thames deposits 282-7 single glaciation 366 Thames route through 287, 317 'East Essex Gravel' 318, 326 interpretations 326 East Essex Gravel Group 277, 279 East Mersea 279 Hippopotamus Site 322, 348, 348, 349, 369-73 Pleistocene deposits 349 Restaurant Site 322, 346, 348, 369-75 true 'last interglacial' site 375 (East Mersea) Restaurant Gravel 369 clast composition, of Blackwater origin 373-4 East Tilbury Marshes Gravel Formation 174, 174, 175, 177, 181, 249 see also Kempton Park Gravel Formation 'Eastend Green Till' 124, 126, 133, 137 Ebbsfleet channel/Ebbsfleet deposits 262-74 Ebbsfleet valley see Northfleet (Ebbsfleet valley) Eemian Stage 10 correlates with Oxygen Isotope Substage 5e 15 Elephant bed, East Mersea 371-2 Elephant, straight-tusked 158, 161, 162, 251, 253, 254-5, 254, 256, 338, 372 Elsterian Stage 16, 17, 53

Emys orbicularis 309 Enborne, R. 163 Eoliths 244 Epidote 148, 273 Epimerization, of amino acids 12 Equus caballus 61, 185 Equus ferus 50, 67, 68, 268, 333, 377 Erosion 25, 52, 70, 72, 76, 97, 98, 110, 112, 141, 159, 160, 171, 180, 182, 188, 202, 203, 215, 232, 267, 290, 312, 338, 340, 345, 346, 355, 359, 361 and aggradation/deposition (cycles of) 25, 61, 233, 267 coastal/marine, at East Mersea 348-50, 355, 369, 374 erosional 'benches' 17, 155, 182, 184, 189 forming terrace surfaces (erosional terraces) 8, 156, 160, 178 post-Anglian 290 role in terrace formation 18-19, 161 Erratics 20, 45, 122-3, 317 Wolvercote Gravel 51 Essex see Chapter 5 continuation of Thames into 6-8 deposits of local rivers 363-4 eastern palaeodrainage following the Anglian glaciation 294-5, 355-6 palaeodrainage up to Anglian glaciation 292-3 fluvial gravel lithostratigraphy 277 Essex till sheet 9, 27 Esso Pit, Purfleet 218, 219, 223, 228 excavated section 221 Estuarine/intertidal deposits (sediments) 18, 19, 159, 330 Aveley 252-6, 259 Clacton 332-7, 334, 335, 337-40, 345

Cudmore Grove 348-55, 350, 354, 368, 371 Little Thurrock 235 Purfleet 222, 225 West Thurrock 204, 237, 241, 247, 251 Evenlode, R. 35, 38, 49 early 57 Evenlode valley 25, 38, 39, 52 Northern Drift deposits 45 Eynsham Gravel Member 35, 37, 40, 61, 66, 67-8, 69, 70, 72, 78, 168 Eynsham Station Pit 72 Fallow deer see Dama Faulting normal 55 West Thurrock 240, 242 Fenny Compton 39 Fern House Gravel Pit 28, 29, 157-62 Ferruginous cement 68 Ferruginous staining 240, 242, 265 Festooning 55, 71, 269 see also involutions Finchley Depression 93, 119, 131, 189 'Finchley Leaf' 189 Fingringhoe 320, 321 'First Crouch Terrace' 360 Flake and hand-axe industries, geographical distribution of 343 Flakes see Palaeolithic flakes Flandrian Stage 10 see also Holocene Flint 65, 141, 328 (sub-)angular 88, 89, 96, 109, 225 artefacts 197, 228, 238, 245, 274 flakes 206, 218, 233, 237, 238, 314, 316, 347 glacially-derived 5, 30, 39, 51, 54, 59, 63, 64 in Hanborough Gravel 50, 52, 57, 65 knapping 26, 204, 220 nodules 152, 220, 221, 240, 244, 246 in Northern Drift 37, 42 with polished facets 269

reworked from Palaeogene/Tertiary 83, 92, 95, 100-1, 106, 115, 136, 181, 266, 280, 288-9, 300, 319, 321, 322-3 (well) rounded 88, 89, 96, 109, 225 in small-clast component of till 123-4 tools/implements 141, 145, 149, 157, 367 see also Hand-axes worked 199, 234, 240, 315, 347 'Floodloam' 370 'Floodplain gravel' 3, 184, 248, 250, 251, 259, 260 Floodplain levels, Early Pleistocene. reconstruction of 18 'Floodplain Terrace' 40, 139 Flow till 291 Fluvial deposits, Devensian and Holocene 41 Fobbing Marshes 330 Foraminifera 12, 225, 334 Fossil shoreline 97 '400 ft (Northaw) Pebble Gravel' 91, 103 Freeland Formation 25, 28, 30, 35, 36, 37, 38-9, 42, 44, 48 post-Cromerian sensu Sugworth 45 Freeland Terrace 47 Frost-boils 53, 54-5, 55 Frost-cracks 55, 314 Furneux Pelham Gravel Pit 114-17 Furze Platt sites at 151 see also Cannoncourt Farm Pit Furze Platt industry 150, 152 'Furze Platt Stage' 153, 155, 233 Furze Platt Terrace 150, 155 Garnet 96 in Northern Drift 45 Geochronometric dating 15, 167, 168

see also Amino acid ratios/geochronology; Radiometric dating; Thermoluminescence dating; Uranium-series dates Gerpins gravel pit 227 Gerrards Cross Gravel Formation 8, 24, 25, 28, 84-5, 86, 90-1, 94, 100, 112, 113, 117-21, 118 age of 120 clast composition 100, 119-20 correlatives in E Anglia 120, 121, 284 Gipping Till 281 'Glacial Beds' 280 Glacial events, correlation between London Basin and the Midlands 29 'Glacial Gravel' 3, 86, 111-12, 114, 115, 118, 142, 188, 280, 318, 353 'Glacial Loam' 318 Glacial ponding of Thames, in Vale of St Albans 113, 124, 126, 131, 133-4 of Thames-Medway and continental Rhine waters 8 'Glacial Sand and Gravel' 286, 374, 385 'Glacial Series' 111, 344 Glacially-derived material, first appearance of 5 Glaciations Anglian 6, 7, 17-18, 19, 47, 121-38, 135, 138, 214, 270, 324 complexity of 113-14 and change in course of early Thames 113 Cromer Till/North Sea Drift 282 Drenthe and Warthe 14 Early Pleistocene 120 Elsterian 281 Saalian 281 and stratigraphical markers within Thames succession 20 Welsh 120

Swanscombe 213-14

Great Waltham Member 290,

Glaciofluvial spillway, Ugley 135 Glaciolacustrine deposits, Vale of St Albans 124, 126, 131, 132 Glaciotectonic processes 286 Glauconite 97, 99 Globe Pit, Little Thurrock 224, 228-37 reappraisal of interpretation 231-3 terrace stratigraphy 235-6 Goldhanger Gravel 367, 374 Goldsands Road Pit see Southminster, Goldsands **Road Pit** 'Goodwood raised beach' 341 Goring Gap 5, 9, 27, 77, 109, 113, 280 terrace deposits lacking 35 'Goring Gap Gravel' 112 Grain Gravel 294 Gravels beneath E Anglian till, southern derivation 280 beneath the Moreton Drift 51 braided-river 212, 222, 353 deltaic 27, 86, 133, 353 early Thames, interbedded glacial sediments 286 glaciofluvial 127, 290 clast and heavy mineral content 291 marine 89, 92, 94, 116 Middle Thames, Vale of St Albans and Kennet Valley 84-5 Upper Thames 36 Grays 212, 215, 260, 271 Grays brickearth 230, 234, 237, 247 Grays Chalk Quarries 224, 238 Grays deposits 21 'Grays Inn Lane Group' 153 Grays Portland Cement Works 238 Grays-Thurrock area sites 224 'Great Eastern Glaciation' 133 'Great Interglacial' 61, 208, 215, 338, 372 see also Hoxnian Stage Great Totham (Lofts Farm Pit) 41, 376-85

291, 296, 297 Greenlands Quarry (Pit) 219, 228 laminated silts 225 shell beds 220, 222 Gulls 55 Gustardwood 98 Halophytic plants 384 Hamstead Marshall Gravel Pit 145-9 Hamstead Marshall Terrace 139, 145, 146, 149 Hanborough Gravel Formation 28, 29, 35, 36, 37, 39, 49-58, 63-4, 74, 217 age of 52, 58 early Saalian 52 pre-Cotswold glaciation 54 biostratigraphical evidence for age of 53-4 correlation with Boyn Hill Gravel 29, 56, 57 and Moreton-in-the Marsh glacial deposits 57, 65 possible correlations 56 solution and periglacial features 54-6 Hanborough Terrace 49, 50, 51, 56-7 Hand-axe makers, in Thames valley 361 Hand-axes 26, 229 absence of, Clactonian gravels 342 Asheldham Gravel 361 Boxgrove 148 in Boyn Hill/Orsett Heath Gravel 233, 236 Cannoncourt Farm Pit 150, 152, 154, 155-7, 156 Clacton 342 Dartford Heath Gravel 187, 189 distribution of hand-axe industries 344 Gerpins Pit 227 Grays Inn Lane 153 Hamstead Marshall 147-8 Highlands Farm Pit 142, 143, 144 Lion Pit tramway cutting 246

Little Thurrock 233, 236 Long Hanborough 50 made in Britain prior to **Clacton Channel** Deposits time 342 Maldon Railway Cutting 364, 365, 367, 368 Northfleet (Ebbsfleet Valley) 266, 267, 268, 270 ovate 210-11, 212 and cordate 190 twisted 204, 205 pointed 60, 152, 206-7 Purfleet 220, 223, 225 Southminster 361 Stanton Harcourt 74-6, 75 Swanscombe 202, 204, 205, 206-7, 210, 212, 218, 229, 237 Upper Dovercourt 363 Wansunt Loam 190 Wolvercote 60, 62-3 Hanningfield Till 281, 282, 365 Harefield Terrace 5, 8, 112, 118, 119 Harrow Weald Common 91. 101-5 Headley Formation 97 Headley Heath deposits 83, 96 correlation with Red Crag 88 Heavy minerals in Diestian outliers 96 in Northfleet deposits 273 Sugworth 45 use of in stratigraphy 96-7 warp sand 60 'Henley Road Terrace' 159, 160 Herpetofauna(s) 225, 352 'Hertfordshire (Lower or 400ft) Pebble Gravels' 91, 92 Hiatuses 24, 204, 215, 234, 272 pre-Anglian 16 High Halstow Gravel 292 High Lodge, Suffolk 26 'High Terrace' 233 'High-level (500ft) Pebble Gravel' 95, 102 High-level deposits, concentration of southern rocks 280-1

High-level East Essex Gravel Subgroup 6, 8, 277, 278, 326, 328, 328, 357, 374 correlation of Medway formations with Kesgrave Group formations 330 Medway deposits 358 product of extended Medway 328 High-level Kesgrave Subgroup 24, 277, 278, 284 outliers 286 'High-level Quartzite Gravel' 281, 284 'Higher Gravel Train' 112, 113, 119 'Higher Pebble Gravels' 102 Highlands Farm Pit 141-5 Hillcollins Pit see Furneux Pelham Gravel Pit Hillwash 271 Hippopotamus 160, 161, 235, 248, 250, 258, 260, 372 Hippopotamus amphibius 72-3, 76 Hippopotamus Site see East Mersea Hippopotamus site, East Mersea 348, 348, 369-745 Hoddesdon Gravel 100, 122, 123, 126, 137 Hodgemoor Wood 114, 115 'Holland Gravel' 318 Holland Gravel Formation 285 correlation with Winter Hill Formation 344 pre-diversion deposit 344 see also Lower Holland Gravel; St Osyth/ Holland Gravel; Upper Holland Gravel Holland-on-Sea Cliff 317-24 Holocene Stage 10 sea-level rise 18, 376 Holsteinian Stage 10, 15, 205 Hornchurch Railway Cutting 176-85 pre-glaciation valley system 183-4 Hornchurch Till 177, 177-8, 179, 182, 366, 367

altitude poses problems for Lower Thames stratigraphy 183-5, 192, 216 suggested correlations 183 Hornstone 110 Horse 161, 235, 250, 258, 269, 373 see also Equus Hoxne amino acid ratios 13 lake beds 61, 218 Hoxnian Stage 10, 47, 56, 61, 76, 126-7, 194, 200, 207, 213, 225, 226, 234, 237, 281 Clactonian and Acheulian industries 143 Oxygen Isotope Stage correlation problem 13 sensu Hoxne 15, 48, 53 sensu Swanscombe 15-16, 21, 29, 53-4, 64, 175, 177, 214, 340, 341, 346, 374 Hoxnian/Holsteinian correlation 13, 14 Human occupation Clacton site, pre-Hoxnian 339 southern Britain 145, 147 '100 ft Terrace' 51, 270 Hydrobia silt, Cudmore Grove 348, 350, 351 Ice-wedge casts 55, 68, 71, 71, 79, 130, 131, 146, 178, 204, 205, 231, 283, 291, 300, 304, 314, 376 Igneous material 120, 328 Ilford (Cauliflower Pit) 177, 257, 259, 260, 261 Ilford deposits 78, 174, 249, 252 amino acid ratios 261 correlation with Ipswichian sensu Trafalgar Square 258 section through terrace deposits 257

two separate terrace formations 259 Ilford (Seven Kings) 261 correlation with Aveley 256

molluscan fauna differs from Uphall Pit 260 reference to higher terrace 259 'Ilford Terrace' 257, 258 Ilford (Uphall Pit) 177, 252, 257, 259, 260, 261, 274 'Ilfordian' Stage 252 Illuviation 148, 169, 283, 290, 295 Imbrication 122, 130 Ingrebourne valley 178, 182, 185 Ingress Vale shell bed 210, 214 Insect remains (assemblages/faunas) Aveley 251, 256 Brimpton 165 Great Totham 382-3 lacking Asiatic species 383 post-Hoxnian/pre-Ipswichian sites 73 Wivenhoe 314 see also Beetle assemblages Interglacial deposits 174, 177, 213, 249, 330 Ardleigh 287, 299, 300, 300, 302, 302, 303, 304 Aveley 21, 177, 252, 262 Belhus Park 177 pre-Ipswichian 227 beneath Stanton Harcourt Gravel 68 **Clacton Channel Deposits** 330-47, 331, 334, 336 Corbets Tey Gravel 226-7 Crayford 249, 250 **Cudmore Grove Channel** Deposits 349, 350, 350, 355 East Mersea 370, 371-3, 375 Ebbsfleet (Northfleet) 267, 268, 273 Gravs 177, 248 Ilford 177, 260 Little Oakley 287, 289, 303, 305, 306, 307, 310, 312 Little Thurrock 236 Magdalen Grove 68-9, 74 Nettlebed 86, 90, 99, 106, 107, 107-8, 108, 110 Purfleet 177, 226-7 Rochford Channel 235, 328

Stanton Harcourt 68, 69, 73-4 Sugworth 41-4, 44, 46-9 Swanscombe 197, 197-2025, 198, 199, 207-9, 213-15 Taplow/Mucking Formation 237 'Upper Floodplain' and 'Ilford' Terraces, relationship of 258 West Thurrock 177, 247, 249, 260 Wivenhoe 313-14, 316-17 see also temperate-climate deposits/temperate episodes Interglacials 10, 16, 40, 76, 205, 251, 353 aggradation during 18 between Anglian and **Ipswichian** 12 between Hoxnian and Ipswichian 66, 228, 248, 252, 257, 260, 262, 273, 274 Cromerian Complex 17, 42, 47, 299, 302-3, 305, 310-13, 316 Hoxnian 13, 205, 208, 212, 214, 347 intra-Saalian 28, 218, 235 Ipswichian 12, 40, 61, 79, 157 sensu Trafalgar Square 175 Little Oakley 287, 289, 302, 306, 307, 310, 312 Oxygen Isotope Stage 7 13-14, 65 post-Anglian 175, 227 pre-Cromerian (sensu West Runton) 17 Summertown-Radley Formation 73, 74 Swanscombe 21 type locality for first post-Anglian 218 see also Hoxnian Stage sensu Swanscombe Waardenburg 17 Westbury 316 Interstadials 317 Brimpton 162-3, 163, 167 Chelford 162-3, 163, 167, 169, 385

Devensian 52, 77, 79, 167, 384 Hoogeveen and Bantega 15 Odderade 167 Saalian 168 Upton Warren 161, 162-3, 167, 385 Wretton 163 Intertidal deposits see Estuarine/intertidal deposits (sediments) Inverted relief, 'Romford River' lowland 180 Involutions 102, 283, 291, 348, 374 polygonal nature of 291 Ipswich 5, 24 Ipswichian Stage 10, 15, 60, 74, 76, 157, 160, 174, 204, 225, 226, 234, 237, 238, 262, 375 and Oxygen Isotope Substage 5e 21 possible Antarctic ice surge during 225, 247, 258 sensu Trafalgar Square 1, 21, 29, 72, 73, 77, 160, 161, 175, 175, 177, 235, 249, 250, 260, 272, 279, 360, 364, 369, 375 **Ipswichian-Eemian correlation** 14 Iron-pans 60 Iver deposits 155-6, 160 'Iver Stage' 155

Jaywick foreshore and hinterland 337 Jaywick Sands 332 Jaywick-Clacton foreshore, position of estuarine beds 337

Kempton Park Gravel Formation 8, 28, 77, 78, 84-5, 86, 91, 100, 139, 140, 151, 161, 175, 249, 252 continued as East Tilbury Marshes Gravel 174 Kempton Park/East Tilbury Marshes Gravel Formation 78, 329 Kennet, R. 3, 83, 140, 145

entrenched in chalk 147 Kennet Valley 87, 163 terrace classification in 140-1 Kensington Road Pit 160 Kesgrave Group gravels 21, 283, 296, 363 differ from Anglian outwash gravels 303 **Kesgrave Sands and Gravels** Group 6, 17, 20, 21, 116, 277, 282, 289, 290, 293, 305, 313, 317, 318, 324, 368 correlation with 'Pre-Pastonian a' 21 early research 280-1 representing terrace aggradations 284, 286 Thames deposits 365 Kettle-hole infills 13, 126, 291, 296 Kingham 52 Kingston Hill gravel 188, 189, 192 'Kingston Leaf 182, 189, 191, 216 Knapping techniques 26, 63, 206, 236 see also Levallois artefacts/techniques Lacustrine/lake deposits 86, 113, 121, 126, 129, 130, 132, 132-4, 137, 182, 184, 316, 324, 355, 366, 367 at Hoxne (Hoxnian type site) 13, 61, 218, 347 'Lag gravel', Cudmore Grove 355 Lake deposits see Lacustrine/lake deposits Lakes Moor Mill see Moor Mill Lake proglacial (ice-dammed) 8, 27, 86, 90, 113, 121, 122, 124, 125, 126-30, 132-4, 324, 328, 367 Watton Road see Watton Road Lake Lane End, Bucks 83, 89 quartzose gravels 89, 90, 96 Langley Silt Complex 155, 156, 159

Lea Basin 128 Lea, R. 121, 128, 129 Lea Valley, Lower 137-8, 367 Thames drainage by way of 126 Leavesden Gravel Train 119 'Leavesden Green Gravel' see Gerrards Cross Gravel Lenham Beds 83, 88, 96, 97, 107 Levallois artefacts/techniques 26, 150, 157, 182, 190, 220, 222, 222, 225, 228, 234, 245, 248-9, 251 at Iver 155-6 Baker's Hole site 262, 263, 264, 266, 269-70, 270, 271-2, 274 West Thurrock 238, 239, 241, 242, 244-6, 247 Levallois working floor 238, 240, 241, 244, 246, 249, 250, 263 proto-Levallois industry 220, 225 Lion Pit, (Aveley) West Thurrock 14, 26, 224 Lion Pit Tramway Cutting, West Thurrock 224, 237-50 new road cutting sections 239, 239 relation to other sites in **Mucking Formation** 249-50 Lion Point, Jaywick 331, 331, 340, 369 Lion Works, West Thurrock 238-9 'Little Eastern Glaciation' 271 Little Heath deposits 83, 89, 91, 94-101, 101 controversy over age and origin 94-5, 96-7 lowest units as Reading Beds 97 as marine deposits 96, 97 Little Heath gravels 95-6, 97 Little Oakley 16, 17, 47, 48, 305-13 biostratigraphy and correlation 310-13 correlation of interglacial

with Ardleigh 312-13 Cromerian channel-fill 318 palaeogeography 309-10 Little Oakley Channel 305-13, 307, 316, 318 Little Oakley Silts and Sands 287, 288, 289, 302, 306, 307, 310 palaeomagnetic polarity of 312 Little Thurrock 212, 215 Little Thurrock deposits 228-37 brickearth 229, 230, 231 interglacial sediments 235 relation to Swanscombe 233 see also Clactonian Industry Lodge Hill Channel 42 Loess 280, 283, 290, 296 Devensian 273 Ebbsfleet 273 pre-Eemian 273 Loessic silt 159, 168-9, 267, 269 Lofts Farm Pit see Great Totham (Lofts Farm Pit) London Basin 83 Pliocene/Lower Pleistocene deposits 88-110 subsidence and uplift in 98 London, central 9 London Clay cliffs, involutions in 348, 374 London syncline 3 Long Hanborough Gravel Pit 49-58 Low-level East Essex Gravel Subgroup 6, 277, 278, 287, 326, 328, 328, 352, 354, 355, 357, 359, 374 lateral equivalents of Lower Thames terrace gravels 330 southern component 328 Thames-Medway deposits 328, 344, 358 Low-level Kesgrave Subgroup 24, 48, 120, 277, 278, 283, 284, 286, 287, 299, 314.318 'Low-level Quartzite Gravels' 281, 284 'Lower Barnfield Stage' 214

'Lower Boyn Hill Terrace' 150, 155 Lower Floodplain Terrace 8, 139 Lower Freshwater Beds, Clacton 333, 337 'Lower Gravel Train' 112, 113, 118, 119 Lower Holland Gravel 286-7, 288, 289, 292, 316, 320-1, 324, 334, 345, 346 pre-diversion deposit 344, 345 Lower St Osyth Gravel 286-7, 288, 289, 292, 315, 319, 319, 320-1, 324 pre-diversion deposit 324 Lower St Osyth/Lower Holland Gravel 287, 320-1 Lower Taplow Terrace 140, 159, 167-8 Lower Thames see Chapter 4 course during formation of **Corbets Tey Formation** 176, 223 deep excavation of valley, late Anglian 216 deep valley system 184 fluvial sequence in 175 longitudinal profiles, terrace deposits 177 Pleistocene deposits of 176 research history 173-6 stratigraphy idealized transverse section 177 problem of Hornchurch Till altitude 183-5 reappraisal of 226 see also Thames terraces, Lower Thames valley infilling during Ipswichian sea level rise 235 'Lower Winter Hill Terrace' 143, 149 Lowestoft Till Formation 111, 182, 277, 280, 281, 283, 289, 290, 291, 296, 296 Lowestoft Till ice sheet 287, 324

Lynch Hill Gravel Formation 8, 29, 64, 84-5, 86, 90-1, 100, 139, 140, 149, 150, 151, 155, 155, 160, 175, 229, 236 pre-dating last interglacial 157 Lynch Hill Terrace 8, 139, 140, 150, 156, 173 Lynch Hill/Corbets Tey Gravel Formation 224, 226, 229, 232, 236, 237, 252, 257, 259, 329 Magdalen Grove Deer Park 14, 65-79 recorded sections 67 'Main Coombe Rock' (Baker's Hole) 267, 271 Maldon Gravel, terrace deposit within Blackwater/ Chelmer system 368 Maldon Railway Cutting 364-8 Maldon Till a Lowestoft Till outlier 364 Maldon Till 137, 182, 281, 282, 364, 369 interpretation of 365-8 second Lowestoft Till ice advance 364 suggested correlations 366-7 Mammalian fauna Aveley 253, 255, 260, 262 Clacton 338-9 **Clacton Channel deposits** 333 Dierden's Pit 210 East Mersea and Cudmore Grove 351-2, 369, 370 Globe Pit 234-5 Grays brickearth 215, 234-5 Great Totham 377, 378, 382 Hanborough Terrace/Gravel Formation 50, 53 Ilford 256, 259 Little Oakley 306 Mucking Formation 249 Northfleet 267, 269, 270 pre-Anglian 316 Redlands Pit 160, 161 Stanton Harcourt 68 stratigraphical problems, Lower Thames 257 Sugworth deposit 46

Summertown-Radley Terrace 67 Swanscombe 193, 200, 202, 207-8 **Taplow Gravel Formation** 158, 161 West Thurrock 238 Wolvercote Channel Deposits 61 see also Vertebrate fauna Mammoth 162, 253, 256, 258 Mammuthus primigenius 73, 158, 244, 254 Mar Dyke 176, 219, 220, 223-4 Mar Dyke sediments 220, 223, 226, 228 Mardley Heath outlier 109 Margaritifera auricularia (Spengler) 226 Marine regression 3, 353 Marine transgressions 340 Diestian 96 Holocene 376 Marsworth 260 Martells Gravel Member 287, 288, 299, 300 not a Thames deposit 301 possible interpretations and age of 303-4 Martells Quarry see Ardleigh (Martells Quarry) Martin's Pit 191 Matuyama-Brunhes magnetic reversal 17, 302, 312 Mayland Gravel Formation 292, 329 see also Belfairs Gravel Formation Medway deposits 279 Medway, R. 8, 180, 182, 292, 294, 309, 323, 326, 363 Anglian course, terraces to W of 292, 323 unaffected by Thames glaciation 318, 324 Medway valley adopted by Thames 188-9 unglaciated 287 Megaloceros 306, 310, 311, 313, 377 Megaloceros giganteus 207, 268, 370 Meres 13

Mersea Island 326 Mersea Island Gravel Formation 285, 294, 322, 329, 344, 345, 349, 350, 354, 369, 369, 373 see also Asheldham Gravel Formation; Boyn Hill Gravel Formation; Wigborough Gravel Formation Mersea Island/Wigborough Gravel Formation 287, 329, 333, 344 Mesvinian Industry 341 Microfaulting 204 Microtine assemblage, Northfleet 266-7 'Mid-Essex Depression' 6, 126, 283, 292 'Middle or 50 ft Terrace' 158, 220, 229, 233, 238, 246-7, 263 'Middle Barnfield Stage', Swanscombe 155, 189, 191, 212, 215 'Middle Glacial Gravel' 280, 281 'Middle Terrace Series' 230 Middle Thames see Chapter 3 Middle Thames Basin 139 pre-diversion deposits 111-13 'Middle Thames' defined 83 Middle Thames terrace sequence 22-3, 27, 139-70, 284 reappraisal of 140 'Middle Thames Valley Gravel Formation' 9 Middlesex Loopway 93, 119 Midlands East, glacial deposits from single episode 282 reappraisal of glacial stratigraphy 56 Thames flowing from 104, 109, 111 Midlands ice sheet 25, 38, 39 Migration, of Thames to south 8, 83, 283, 310, 356, 363 Milton-under-Wychwood 29-30, 52 Mimomys savini 16, 46, 208, 310, 311, 312, 313

Mole-Wey tributary 6, 93, 104, 105 in Finchley Depression 119 Mole-Wey-Wandle valley, reversed section 126, 128 Mollusca Aveley 261, 262 Brimpton sediments 164-5, 165, 167 Clacton deposits 331, 338 **Clacton Estuarine Beds** 333-4 **Clacton Freshwater Beds** 333 Cudmore Grove Channel Deposits 351 Dartford 188, 217 distinction between Aveley and Trafalgar Square? 258 East Mersea Restaurant Site 370 Globe Pit 234, 235 Grays 234 Great Totham 379 Greenlands Quarry, Purfleet 220-2, 226 Hanborough Gravel Formation 49, 50-1 Ilford (Cauliflower Pit) 259 Ilford (Seven Kings) 259, 260 Ilford (Uphall Pit) 259 Little Oakley 306, 308, 309, 311 Northfleet 263, 265-6, 268, 269, 272 Rhenish Suite 208, 209, 210, 215, 338 Sugworth deposit 46 Swanscombe 193, 196, 200, 202, 208, 213 West Thurrock 239, 240, 243. 247 Westmill Quarry 127 Wolvercote Channel Deposits 61-2 Monoglacial model, replaced 281 Moor Mill lake 125, 128, 133, 324 Moor Mill Laminated Clay 130, 131, 132, 133, 289, 324

Moor Mill Quarry 129-34 Moreton Drift **36**, **38**, 39, 51, 57 age of 51-2 Moreton glaciation 29, 56, 57 Moreton-in-the-Marsh 29 Mousterian industry 158, 244, 246, 267, 270, 341, 344 Mucking Gravel Formation 26, 77, 174, 174, 175, 176, 177, 181, 226, 239, 246, 248, 250, 252, **253**, 257, 258-9, 260, **294**, 356 *see also* Taplow Gravel Formation

Natural History Museum 256, 261, 264, 268, 333, 370 Neomys fodiens 356 Nesovitrea bammonis 165 Netley Heath 91 Netley Heath deposits 83, 96, 97 correlation with Red Crag 88 Nettlebed 20 channel at 107-10 Nettlebed Gravel Formation 5, 84-5, 86, 90, 94, 99, 101, 103-4, 105, 109, 111, 112 correlation with 400 ft Pebble Gravel untenable 109 material from the Midlands 92 Nettlebed interglacial deposits 86, 90, 99, 106, 107, 107-8, 108, 110 'New Barn Pit' 263 Newney Green Member 289, 290, 291, 296, 297 correlation with Maldon Till 367 fabric orientation 298 Newney Green Quarry 283, 287-99 Noordbergum 17, 312 North London Pebble Gravel Subgroup 99, 104, 109 see also Northaw Pebble Gravel Formation; Stanmore Pebble Gravel Formation Northaw Pebble Gravel

Formation 84-5, 94, 99, 101, 102, 103, 104, 105 'Northern Drift' 9, 25, 30 Northern Drift Group 35, 35, 36, 37, 41-2, 50, 52, 86, 115, 284 alternative interpretation 37-8 in existence by Cromerian 42, 45 origins of 41-2 polygenetic interpretation 45 Northfleet 246 Northfleet deposits 249 Northfleet (Ebbsfleet valley): Baker's Hole complex 14, 262-74 location of Baker's Hole site 267-8 Northmoor Gravel Formation 35, 36, 37, 38-9, 40-1, 50, 77, 385 Northmoor Terrace 40 Northmoor/Shepperton Formation 78 Oakley Gravel Formation 285, 286, 287, 289, 292, 302, 305, 306, 307, 363 Thames-Medway composition 310 see also Ardleigh Gravel Formation **Oakwood Gravel Formation** 292, 309, 313, 323, 327, 329 Organic deposits/sediments 40-1, 70, 106 Ardleigh Formation 299-304, 300 Aveley 251-2 Brimpton 162, 170 Clacton 334, 369 Cudmore Grove 348, 350, 350-1, 352, 369 Gerpins Pit 227 Great Totham 369, 376, 377, 381, 384-5 Hatfield 126-7 Marlow 161 Nettlebed 106-8, 108 Reading 160 Stanton Harcourt 68, 70

Sugworth 42 Swanscombe 202 Wivenhoe 287, 314-17, 315 Wolvercote 60 **Orsett Heath Gravel Formation** 174, 175, 176, 177, 178, 179, 181, 183, 191, 212, 224, 236, 257, 294, 361 see also Boyn Hill Gravel Formation Orsett Road Pit 224 Ostracods Aveley 255, 258 Clacton 332, 333, 336 Corbets Tey 227 Cudmore Grove 351, 357 East Mersea (Restaurant Site) 369, 370 Gravs 229 Great Totham 380, 380, 383-4 Little Oakley 305, 306, 309, 311, 313 Purfleet 223, 225 Sugworth 42, 46-7, 49 West Thurrock 239, 240, 243 Westmill Lower Gravel 124 Wolvercote 60 Outwash 6, 29, 39, 123, 280, 281, 282, 292, 317, 321, 324, 353 Anglian 57, 109, 289, 303 quartzite-rich 54 Outwash stream, replacing Thames in NE Essex 323 Overbank deposits 194, 204, 209 Ovibos 205 Oxygen isotope curve 11, 12 correlations of post-diversion Thames sequence with 20-1 **Oxygen Isotope Stages** Stage 5 Substage 5a 167 Substage 5e 12, 15, 21, 161, 175, 251 Stage 6 162, 273 Stage 7 14, 21, 26, 28, 63, 64, 65, 73, 77, 159, 161, 213, 248, 249, 250, 251, 252, 260, 262, 273, 274, 340, 356 marine stratotype 14

Stage 8 26, 28, 77, 157, 161, 168, 236, 237, 248, 250, 273 Stage 9 13, 29, 40, 57, 63, 64, 65, 127, 157, 214, 218, 228, 248, 261, 356, 361 Stage 10 29, 57, 157, 217, 228, 229, 237, 356 Stage 11 13, 15, 26, 29, 48, 54, 63, 213, 214, 217, 340 see also Hoxnian Stage, sensu Swanscombe Stage 12 13, 21, 29, 48, 57, 175, 217, 340 Stage 13 116 Stage 15 215 Oxygen isotope stratigraphy 12 Oxyloma pfeifferi 52, 71 Palaeocurrents Ardleigh 300-1, 301, 303 Bullscross Farm, Waltham Cross 126 Cudmore Grove 349, 353, 374 Moor Mill Quarry 130, 133-4 Newney Green 290 Purfleet 219, 221, 224 St Osyth 319 Southminster 357 Swanscombe 209 Ugley Park Quarry 136 Westmill Quarry 123 Westwood Quarry 118 Palaeolithic artefacts 26, 86, 182, 215, 314 'Ancient Channel' 142-3 Cannoncourt Farm Pit 150-3, 154 Clacton 331-2, 337, 341-3, 346 Cudmore Grove (East Mersea) 350, 355 Dartford Heath Gravel 189 Ebbsfleet valley 263, 264, 266, 270, 271-2, 274 from local river terraces 363 Globe Pit 229, 231, 233-4, 236, 237 Hamstead Marshall Gravel Pit 145, 147

Hanborough Terrace 50, 56 Highlands Farm Pit 141, 142 Little Thurrock see Globe Pit Maldon 364, 367 Northfleet 263-70 pre-Hoxnian 144 Purfleet 219, 220, 228 **Bluelands and Greenlands** quarries 222-3 Botany Pit 220 Southminster 361 Stanton Harcourt 74-6 Swanscombe 194-218 in Thames deposits 25-6 typological evolution of 20 West Thurrock 237, 240, 242, 244, 245, 246 Wolvercote Channel 40, 59, 60, 62-3 see also hand-axes Palaeolithic cores 206, 218, 222, 234, 245, 270, 331, 341, 342 'chopper-core(s)' 190, 206, 210, 234, 236 Clactonian 142, 143, 197, 206, 237, 266, 343 Levallois 26, 156, 212, 220, 246, 266 'tortoise core(s)' 212, 220, 244, 245, 246 Palaeolithic flake-core industry 26, 344 Palaeolithic flakes 26, 150, 157, 158, 187, 196, 200, 202, 206, 218, 221, 222, 234, 238, 245, 246, 270, 314, 316, 331, 341, 342, 345, 346, 350, 355, 364 Clactonian 142, 143, 197, 206, 210, 234, 236, 237, 266, 342 conjoinable 200, 206, 246, 250-1, 342 hand-axe making/finishing 60, 220, 236, 343, 361 Levallois 26, 155, 156, 190, 220, 225, 244, 246, 263, 266, 270 Palaeoliths, in pre-Anglian sediments 316 Palaeoloxodon antiquus 53, 158, 255, 255, 337

see also elephant, straight-tusked Palaeosols 15, 21, 151, 267, 293, 299, 301 Ardleigh 299, 300, 304 beneath Lowestoft Till 283 Cromerian 132, 283 Newney Green 289, 296, 298 reworked sediment, **Cannoncourt Farm** 156-7 in top of Gerrards Cross Gravel 121 see also Barham Soil; Buried soils; Valley Farm Soil Palynological-mammalian evidence, discrepancies 10, 12 Palynology Brimpton 163, 163-7, 166 **Clacton Channel Deposits** 334, 339-40 for dating British Pleistocene 9-10 Little Oakley 309, 312 Nettlebed 107-8 West Thurrock 247 Wivenhoe organic sediments 316 see also Pollen analyses; Pollen assemblages; Pollen sequences **Passmore Edwards Museum** 337.355 Pastonian Stage 10, 16, 283 Pastonian-Tiglian C5-6 correlation 21, 24 Patination, of artefacts 204, 207, 212 'Patterned ground' 71, 297 Paxford Gravel 30, 52 Paxford Gravel/Hanborough Gravel correlation 51 questioned 54 Pearson's Pit 184, 189 buried channel 191, 193 Pebble beds, within Palaeogene strata 83 'Pebble Gravel' 3, 112 Pebble Gravel Group 83, 86, 88-94, 94, 105, 111 age and origin 89-92, 96 correlated with 'Mundesley

and Westleton Beds' 88-9 redefined 91 sensu lato 97, 103 as a 'Glacial Drift' 96 redefined 92 sensu stricto 91-2 subdivisions of 89 Pebbles chert 83, 118 flint 89, 106 Ightham Stone and Hastings Beds 359 'lydite' 83, 89 quartz 3, 83, 97-8, 106, 109, 111, 114, 118 quartzite 106, 109, 111, 118, 158 showing Midlands link 86 reworked from Palaeogene/ Tertiary 83, 95, 115, 136, 266, 280, 300, 319, 321 Pedogenesis 118, 156, 168, 271 Hamstead Marshall 145, 148 Kesgrave Group sands and gravels 21, 283 Swanscombe Lower Loam 201-2 Pedogenic mixing, in situ 98 'Penultimate Interglacial' 339 Periglacial conditions 20, 41, 49, 52, 169, 260 Ardleigh 299 Boyn Hill Gravel 56 Hanborough Terrace deposits 47, 54-6, 58 pre-Anglian 295 Summertown-Radley sequence 69, 70, 71, 79 Swanscombe 198, 205 Westmill Lower Gravel 130 Periglacial deposits **Kesgrave Sands and Gravels** 282 Northfleet sequence 265 Wivenhoe 313, 314 Periglacial processes 248, 336, 374 modification of Valley Farm Soil 295 post-depositional 146 Permafrost conditions 300

Phaedon segnis 383 Pipes Hanborough Gravel Formation 51, 53, 54-5, 55 formation hypothesis 55-6 Lynch Hill Gravel 151, 157 Plant macrofossils 41 Ardleigh 299, 300 Brimpton 163-5, 167 Clacton 333 Great Totham 382, 384 Plateau Drift see Northern Drift 'Plateau Gravel' 142 Pleistocene chronostratigraphy and correlation 9-17 Pollen analyses Ardleigh 300, 312 Clacton 339 Great Totham 384 Little Oakley 309 see also palynology Pollen assemblages Brimpton 163-4, 165 **Ipswichian 234** Little Oakley Silts and Gravels 310 Magdalen Grove/Stanton Harcourt 71-2, 74 Purfleet 225 Swanscombe 194, 200, 204-5, 208, 213 Pollen diagrams 108, 166, 339, 381 Pollen samples, laminated deposits, Greenlands Quarry 225 **Pollen sequences** Clacton 338 Cudmore Grove 352, 355 Ipswichian 249 Wivenhoe 314 Pollen spectra Aveley 256 Swanscombe 204 West Thurrock 239 Westmill Quarry 127 Pollen zones Brimpton sediments 163, 165, 166, 167, 169 Cromerian 16 see also biozones 'Ponders End or Upper Floodplain No 1 Stage' 271

'Post Glacial' drift 318 'Post-glacial Gravel' 353-4 'Pre-Coombe Rock Erosion Stage' 271 'Pre-Pastonian a' Stage 16, 21, 24, 25, 116 Priest's Hill, Nettlebed 105-10 Proglacial lake deposits 113, 128, 324 Proglacial lakes 27, 121, 126, 132, 134 edge of Ware Till ice 125, 126 Hornchurch area 182 Newport, NW Essex 367 Progradation, deltaic 353 Proto-Soar, Middle Pleistocene erosion by 25 Proto-Soar valley 25 Pupilla muscorum 52, 71, 165, 265, 267 Purfleet Anticline 218-19, 223, 258 Purfleet deposits in abandoned Thames channel 220 biogenic 174 interglacial 235 Thames origin for 226 Purfleet GCR site 218-28, 259 correlation problems 225-7 generalized sequence 222-3 see also Bluelands Quarry; Botany (Chalk) Pit; Esso Pit; Greenlands Quarry Quartz 141, 284, 303, 320, 328, 360 Quartz signatures, pebble gravels 104 Nettlebed deposit 109-10 Quartzite 141, 284, 303, 320, 328, 360 Quendon Till 137, 367 Radiocarbon dating Brimpton deposits 167, 168, 169 Great Totham 381 Radiometric dating 12, 340

Ramsden Heath Formation 35,

37, 38-9

Rassler Gravel Formation 8, 24, 84-5, 86, 90, 94, 119, 120, 286 Rassler Terrace 5, 8, 27, 112 Reading area, re-evaluation of terrace stratigraphy 27-8, 42, 160-1 Reading Beds 83, 104, 135, 145, 151 facies at Lane End 89, 96 Reading Town Gravel 28, 159-60, 168, 248 Red Crag 86, 97, 98, 99, 286, 303, 306, 307 age of 88 possible correlation with Little Heath and Lane End deposits 98-9 **Redlands Pit** 160 Rejuvenations 7, 17-18, 19, 20, 25, 28, 30, 48, 77, 144, 161, 168, 216, 345, 346, 361, 385 Lower Thames 173 Marlow area 161-2 Remanié fauna 57 Restaurant site see East Mersea Reworking of flints 95 of fossils 338 of gravel from Kesgrave Group 373 of mammalian remains 52, 56, 70, 76 molluscan fossils 160 of Palaeogene pebbles 115 Rhaxella chert 136, 188, 210, 214, 299, 300, 303, 320, 321, 328, 360, 363, 365, 373 Rhinoceros 338, 372 Rickson's Pit (Swanscombe) 211-12 Ripple(s) 95 **Ripple-drift lamination** 68, 199, 202, 209, 221, 240, 357, 359 Roach Gravel 327 Rochford Channel 235, 328 Rochford Channel Gravel 235, 328 Rochford Channel interglacial deposits 235, 328 Rochford Gravel 235, 327, 330 Rodent assemblages 207-8 Cudmore Grove 353 Romford, till in railway cutting 178, 179, 182 'Romford River' 180, 326 Rubification 148, 271, 283, 291, 293, 301, 304, 317 Rutter's Pit 250 Saalian Stage 10, 13, 14, 25, 28, 38, 39, 59, 60, 162, 168, 237, 246, 271, 281 early 212, 368 Late 248 mid 226 St Albans, Vale of see Vale of St Albans St Lawrence Gravel Formation 292.329 see also Canewdon Gravel Formation St Osyth 24 St Osyth Gravel 285 see also Lower St Osyth Gravel; Upper St Osyth Gravel St Osyth Gravel Pit 317-24 St Osyth/Holland Gravel Formation 24, 314, 316, 329 correlation with Winter Hill/Westmill Gravel 24 Sarsden gravel 30 Sarsen 110 Satwell Gravel Formation 5, 84-5, 86, 90, 94, 99, 112 Scottia browniana 46-7 Scour features 60, 240, 266, 270 Scour hollows 370 Sea level Hoxnian 340-1 Pleistocene changes climatically-controlled 17 relative, rises during interglacials 18 Severn, R. 4 'Severn-Thames' R. 25, 45, 46, 111, 120 Shakespeare Channel 294 Shakespeare Gravel 294 Shear planes, indicating ice movement 124

Shenley gravel 104 Shepperton Gravel Formation 8, 39, 77, 86, 91, 100, 139, 140, 169, 177 see also Northmoor Gravel Formation Shiplake gravel 142 Shoeburyness Channel 235, 294, 360 interglacial deposits 328 Shoeburyness Channel Deposits 235 Shoeburyness Channel Gravel 328 Shoeburyness/Burnham Channel 360 Silchester Gravel Formation 56, 90, 139, 140, 144 correlations 147 interpretation of 145-9 Silchester Gravel/Black Park Gravel Formation 140-1, 149 'Silchester Gravels' 51, 56 Silchester Stage 146 Sinuous courses 27, 353 of Corbets Tey Gravel Thames 219, 220, 223-4, 251 Slickensides 256, 270 Slope deposits 194 Slopewash 158, 187 Small-mammal fauna, Cudmore Grove and Grays 356 Small-vertebrate assemblages Cudmore Grove deposits 351 Great Totham 379 see also Vertebrate fauna Smug Oak Gravel 100, 127, 130, 131 correlation with Black Park Gravel 127, 133 correlation with Westmill **Upper Gravel** 134 palaeocurrent data 134 post-diversion 133 Soil profiles, Kennet terrace gravels 169 Soils 298 Cromerian 283 palaeo-argillic 321 see also Barham Soil; Valley

Farm Soil Solifluction 60, 108, 118, 156, 196, 242, 266, 270, 342 Solifluction deposits 150, 158, 204, 205 Solution affecting underlying Chalk 118, 151, 189, 202, 215 of coombe rock 240, 242 Solution hollows 240, 266 'South Hertfordshire Plateau' 91 Southchurch Gravel Formation 294, 328, 329, 329, 330 Southchurch/Asheldham Gravel 322, 327, 329 linked to Kesgrave Group in southern E Anglia 329-30 Southend area, gravel formations 328, 329 Southend Arterial Road sections 182 Southend Channel 294, 328, 345, 356 Southend Channel Gravel 328 Southend Channel interglacial deposits 328 Southend/Asheldham Channel 356 Southend/Asheldham Channel Gravel 327 'Southfleet Pit' 263 Southminster 279 Southminster, Goldsands Road Pit 357-62 Southminster Terrace 360 Sphaerium rivicola 370 Spring Gardens Gravel Member 161, 249 Springfield Till 281, 282, 365 Stadials 162 late mid-Devensian 163 Stanmore Pebble Bed 91, 99 Stanmore Pebble Gravel Formation 84-5, 89, 91, 94, 99, 101, 101-5 as a beach deposit 103 correlation with Little Heath Gravel 91, 103 interpreted as fluviatile 104 Stanton Harcourt 14, 21, 36, 68, 249, 261 section through deposits 70

Stanton Harcourt Channel 35, 37, 40, 64, 66, 66-79, 69, 70.77 Stanton Harcourt Channel Deposits 35, 37, 40, 66, 68, 69, 70, 73-4, 79 interpretations 73-4 stratigraphical marker for Oxygen Isotope Stage 7 77 Stanton Harcourt Gravel Member 35, 37, 40, 66, 68, 72, 78 age of 76 a cold-climate deposit 68, 69, 70, 72 Stanton Harcourt Gravel Pit 65-79 'Static washing' 89 Stoke Gravel Formation 294 Stoke Newington 227, 236 'Stoke Park Cut' 140, 160 'Stoke Park Terrace' 140 Stoke Row Gravel Formation 5, 84-5, 86, 90-1, 92, 94, 99, 101, 104, 105, 109, 111, 112, 114-16, 284 Midlands material in 117 Stoneham's Pit 250 Stort, R. 135 Stort-Cam tunnel valley 135 Stortford Till 122, 123, 127, 137, 183 localized 123 Stortford Till ice 125, 128, 183 Stour, R. 38 Stratification see Bedding/ stratification Strike river, Thames within London Basin 83 Subsidence late Pleistocene 341 North Sea Basin 279, 376 Sugworth 16, 20, 36 Sugworth Channel 28, 35, 37, 39, 41-9, 43, 44 Sugworth Channel Deposits 28, 37, 37, 42-9 biostratigraphical implications of 46-7 implications for terrace stratigraphy 42, 44-5

Sugworth Road cutting 41-9, 311 Summertown-Radley deposits/sequence 7, 17-18, 19, 28 Summertown-Radley Formation 35, 36, 37, 39, 40, 65, 66, 66, 71, 72,84 complex succession 160-1 correlation with Reading Town Gravel 77, 160 correlation with Taplow Formation 77, 78, 168 Summertown-Radley Terrace 40, 61, 65, 72, 168 correlation with Upper Floodplain Terrace 76 Swanscombe 10, 18, 21, 26, 48, 143, 153, 193-218, 237, 341 Lower Gravel 9, 153, 177, 191, 194, 197, 198, 198, 199, 210, 342 Palaeolithic record 206-7 Swanscombe deposits 177, 181, 184, 188, 196-205 age problem 184 Basal Gravel 196, 213 channel deposits 204 Higher loams 205 Hoxnian correlations 174, 194 Lower Gravel 197 Lower Loam 177, 191, 194, 196, 197, 199, 200-2, 206, 233 buried soil 201, 203, 215 Lower Loam/Middle Gravel boundary 201, 215 Lower Middle Gravel 181, 198, 199, 202, 209, 212, 233 Midden Complex 196, 198 palaeoenvironmental and palaeogeographical significance 208-10 as part of Boyn Hill Formation 214 soliflucted clay 204 Upper Gravel 196, 205 Upper Loam 177, 190, 196, 199, 204-5, 209 channel-fill to overbank

deposit transition 209 Upper Middle Gravel 198, 199, 202-4, 210, 213 correlation with Boyn Hill deposits 215 reduction in flow energy 209 Upper Middle Gravel/Upper Loam transition 203-4 Swanscombe Lower Gravel Channel 197, 216, 294, 344 'Swanscombe Man' 194 Swanscombe Middle Gravel industry 157, 190 Swanscombe skull 202, 205-6, 218 Swanscombe-Dartford Heath deposits controversy 188, 189, 191 Switchback Road quarry 151, 156

Tanousia 311 Taplow Gravel Formation 8, 28, 28-9, 39, 64, 84-5, 86, 90-1, 100, 139, 151, 157, 159, 160, 168, 175 correlation with Mucking Gravel 174 misidentified downstream from London 159 pre-Ipswichian age 162 see also Summertown-Radley Formation 'Taplow Stage' 271 **Taplow Station Pit 158** Taplow Terrace 3, 8, 64, 76, 139, 139, 155, 158, 159, 170 Taplow/Mucking Gravel Formation 77, 78, 224, 230, 237, 248, 250, 272, 329 Tectonic (isostatic) adjustment 18 Tectonic movement, differential 97 temperate-climate deposits/temperate episodes 156, 160, 207, 236 Ardleigh 299, 300, 300, 301-2, 302

between Little Oakley interglacial and Anglian Stage 317 Brimpton Interstadial 170 **Clacton Channel deposits** 334 Evnsham Gravel Member 69 Ilford 260 intra-Saalian 14-15, 260 Little Oakley 287, 289, 302, 305, 306, 307, 310, 312 Nettlebed interglacial sediments 107-8, 110 Northfleet 267, 268, 269, 272 post-Anglian 375 post-diversion 21 post-Hoxnian 200, 248 Purfleet 228 Summertown-Radley deposits 67, 69, 70, 73, 74, 76 Swanscombe 213-14, 216, 218 Swanscombe Lower Gravel 197 Wivenhoe 314 see also Interglacial deposits Tendring Association 315, 321 Tendring Plateau 24, 278, 286, 287, 299, 305, 310, 313, 317, 318, 326, 330, 331, 343 gravel formations 285, 329 Terrace formation 17-19 during cold episodes 116 local Essex rivers 363-4 modified climatic model for 18-19, 25, 63, 303 Terrace stratigraphy, Upper Thames 78 Thallassostatic terraces 17, 18 Thames terrace system 3-5 chronostratigraphical interpretation model 18 evolution of disrupted by Anglian glaciation 217 Thames terraces correlation of 26-30 correlation with deep-sea record 12, 173 and deposits, classification of 8-9

early attempts at definition 112 early classifications 188-9 longitudinal profiles 22-3 Upper Thames terrace deposits 38-9 Lower Thames 173-6, 177 alternative dating model 174-6 controversy, dating of post-Boyn Hill/Orsett Heath Gravel interglacial sediments 256-8 stratigraphical reappraisal of 258-9 stratigraphy of 19-25, 30-1, 217, 249 see also terrace formation Thames Works Quarry 224, 238 Thames-Thames-Medway course, Hoxnian (sensu Swanscombe) 341 Thames-Colne confluence 189 Thames-Medway confluence early 286 pre-diversion 305, 309-10, 320 Southend area 326, 328, 361-2 Thames-Medway course southward migration 374 submerged valley, off Essex coast 329 Thames-Rhine, joining of 215 Thanet Beds 135 Thanet Sand 185, 225, 231 Thatcham Terrace 85-4, 90, 139, 147, 169 continuation of Taplow Terrace 163 Thatcham Terrace Deposits 141, 162 pollen zone interpretations 163, 163-5 Theodoxus serratiliniformis 208, 209 Thermoluminescence dating 14 Northfleet deposits 273 Stanton Harcourt Channel deposits 73 Swanscombe 194, 213 Thorpe-le-Soken 363

Tills banding in 297 see also named tills Tiptree Ridge 286 Tollesbury Gravel 294, 322, 369, 374 correlation with Mersea Island Gravel and gravel at Maldon 368 Trafalgar Square 10, 262 biogenic deposits 174 Ipswichian deposits 226, 249, 257 Trafalgar Square Sands and Silts 78, 161 'Trail' 239, 265, 267, 343 Travertine clasts 14 Trent, R. 4 Trent system 120 Trogontherium cuvieri 336 **Tunnel Cement Works West** Thurrock 238 Tursiops truncatus 211 'Type X' palynomorph 213, 339, 352, 355

Ugley Gravel 84-5, 100, 122, 123, 126, 128, 136, 303 clast composition 136 Ugley Gravel/Westmill Upper Gravel correlation 136-7 Ugley Park Quarry 134-8 stratigraphical relations of later Anglian glacial and glaciofluvial deposits 136-7 Ugley Till 128, 135, 137 Unconformities 9, 203 Uphall Pit see Ilford Uplift Ilford-Aveley area 258 isostatic 98, 133, 217 Miocene 281 Upminster brickyard 182 Upper Bagshot (formerly Barton) Pebble Beds 83 Upper Dovercourt, Stour terrace deposit 363 Upper Floodplain Terrace 8, 77, 139, 184, 251, 258 Upper Freshwater Beds, Clacton 333, 337 Upper Holland Gravel 288, 289, 292, 319, 321, 324

interpretation of 321, 343 Upper St Osyth Gravel Member 288, 289, 292, 319, 321, 323, 324 affinity with Anglian glacial gravels 319-20 outwash gravel component 321 southern component 323 Upper St Osyth/Upper Holland Gravel 287, 287, 324 Upper Taplow Terrace 140, 159 **Upper Thames** see Chapter 2 and Middle Thames, terrace correlation between 26-30, 48, 56-7 Pleistocene sequence in 35-41 Upper Thames deposits, advocated stratigraphical interpretation 64 Upper Thames gravels 84 Upper Winter Hill Terrace 27, 149 Upton Warren 383 Upton Warren Interstadial 161, 163 correlation with Odderade Interstadial 167 Uranium-series dates 14, 194, 213, 340, 373 Ursus spelaeus 207

Vale of St Albans 5, 24, 27, 28, 86, 104, 320 Anglian glaciation in 40, 83, 121-9, 138 demise of early Thames 113-14 glacial deposits a stratigraphical marker 6 Hoxnian deposits/till sequence relationship doubts 127 palaeodrainage during Anglian, evolution of 125 pre-diversion deposits 111-13 Thames route in 85, 93, 113-14, 124, 125

Valley Farm Soil 21, 121, 283, 284, 290, 290-1, 293, 295, 296, 299, 304, 305, 315, 317 Valley gravels 3 Ventifacts 291 Vertebrate fauna Cudmore Grove 355 Little Oakley 309, 310-11 see also Herpetofauna; Mammalian fauna; Small-vertebrate assemblages Viviparus diluvianus 208, 209 Volcanic rocks, from N Wales 284 Waldringfield Gravel Formation 24, 284, 285, 286, 287, 289, 292, 293, 315, 329 Wansunt Channel infilling 271 Wansunt Loam 177, 187, 189, 193 and its Palaeolithic industry 190-1 Wansunt Pit, Dartford Heath 185-93, 210 contrasting interpretations of sediments 186 Ware Till 91, 122, 124, 126, 130, 131, 133, 134, 137, 367 partial stratification 130 Ware Till ice 125, 126, 134 ponding event 126 and Thames diversion 127-8 Warp sand 59, 60 Warping, differential, Holocene 341 Waterman's Lodge Formation 35, 37, 38 Watton Road lake 125, 126, 128, 133, 324 Watton Road Laminated Silts 126 Weathering damage to faunal remains, Swanscombe 217 sub-aerial 201, 203, 215, 233 top Swanscombe Lower Loam 194

West Cliff, Clacton 332, 333, 335, 336, 369 West Runton 17 West Runton Freshwater Bed 16 vertebrate fauna 310-11 West Thurrock deposits 78, 237-50, 259, 260, 273, 274 brickearth 237, 238, 239, 240, 241, 242, 247-8, 251 pollen-based interpretation challenged 248 West Thurrock Gravel 174, 248 Westland Green Gravel Formation 5, 24, 84-5, 86, 90-1, 92, 94, 99, 101, 104, 109, 111, 112, 113, 114 along early Thames route 116-17 correlation in E Anglia 116, 284 correlation with Gerrards Cross Gravel 284 fluviatile origin 116 'Westleton Beds' 103, 106, 280, 281, 282 'Westleton Series' 281, 282 'Westleton Shingle' 95 Westmill Lower Gravel 6, 27, 91, 100, 123, 123, 124, 125, 130, 131, 133, 289 periglacial conditions during deposition 130 sensu Cheshire 113 Westmill Quarry 121-9 Westmill Till 122, 123, 124, 128, 135, 136 preferred fabric orientation 137 Westmill Till ice 125 Westmill Upper Gravel 84-5, 122, 123, 124, 125, 128, 184, 192 change in palaeocurrent direction 122-3 continuation down Lea valley 126, 184 post-diversion R. Lea deposit 124 see also Hoddesdon Gravel;

Ugley Gravel Westwood Quarry 117-21 Wey, R. 192 Wigborough Gravel Formation 285, 294, 322, 331, 334, 345, 345-6, 369 see also Asheldham Gravel Formation; Boyn Hill Gravel Formation: Mersea Island Gravel Formation Wilcote Formation 35, 37, 38, 38 Wimbledon Common gravel 188, 189 Winter Hill Gravel Formation 6, 7, 8, 17-18, 19, 27, 28, 39, 42, 48, 56, 83, 90, 94, 100, 113, 119, 139, 149, 286, 321, 329 downstream continuation 122 see also St Osyth/Holland **Gravel Formation** Winter Hill Lower Gravel Member 27, 86, 91, 289 Winter Hill Terrace 5, 8, 112, 113, 133, 139, 139, 142, 143, 144, 145, 189 Winter Hill Upper Gravel Member 27, 84-5, 86, 91, 113, 133, 289, 324 deltaic 133 Winter Hill/Westmill Gravel 24, 27, 84-5, 119, 124 possible correlation, St Osyth/Holland Gravel 321 Wivenhoe Gravel Formation 285, 286, 288, 289, 292 age of 316 interglacial deposits 313-14, 316-17 temperate-climate deposits 314-16 Wivenhoe Gravel Pit 313-17 Wivenhoe Lower Gravel 289, 314, 315, 317 Wivenhoe Upper Gravel 289, 314, 315, 316-17 Wivenhoe/Cooks Green Gravel Formation 24, 287, 313-14, 316, 317, 319, 329

'Wolstonian' glaciation 282
Wolstonian Stage 10 see also Saalian Stage
Wolvercote brick pit 59
Palaeolithic site 62-3
Wolvercote Channel 29, 35, 37, 40, 58, 58-65, 64, 74, 75
stratigraphical position of 60-1
Wolvercote Channel Deposits Member 35, 37, 40, 59
age of 60-1 correlations 63-4 stratigraphical interpretations 61 Wolvercote deposits 21, 58-65 Wolvercote Gravel Formation 29, 35, 36, 37, 39, 39-40, 59, 60, 84 age of 63 correlation with London Basin terrace sequence 64 Wolvercote Terrace 59, 74 Wolvercote Terrace deposits 29, 59
Wolvercote/Lynch Hill Gravel Formation 29, 64
Wood, compressed 350, 351, 351
Woolly mammoth 162 see also Mammoth; Mammutbus primigenius
Wretton Interstadial 163

Ziphiid whale bone 304