

Nitecki, Mathew H. and Nitecki, Doris V. (editors) (1987). The Evolution of Human Hunting. Plenum Press: New York. ISBN 0 306 42821. 464pp. \$U.S. 75.00 (hard cover).

Titles can be misleading, especially in the case of edited volumes. This book is the outcome of a symposium on the Evolution of Human Hunting held at the Field Museum of Natural History in Chicago, USA, in May 1986. What it offers is more of a series of views on aspects of the evidence for meat procurement by hominids over the last two million or so years than a step-by-step discourse on the development of hunting itself. One of the chapters, by Morlan, on the archaeology of Beringia, does not even do that: it offers precisely what its title says it does, with a few asides on colonisation and possible mammoth butchery, although it is a useful summary of the literature on this interesting region. Behrensmeier gives an adequate, if somewhat pessimistic review of some of the problems of inferring hunting from the fossil record and, although she mentions some later sites, the emphasis is on the African Plio-Pleistocene. The only chapter that really offers a longer-term view is by Trinkhaus, who concludes that there is little evidence for the impact of predatory behaviour on the course of our evolution; early hominids were not, in his words, acting out Ardreyesque versions of 'Rambo meets the megafauna'¹ (p. 107). Of course that conclusion is heavily dependent on previously published interpretations of human meat procurement activities offered by people such as Klein and Binford.

Both of the latter authors contribute chapters. Klein argues that Lower and Middle Pleistocene sites, usually open-air localities, offer little clear evidence of animal exploitation in comparison with Upper Pleistocene cave deposits. He questions the extent of human involvement in the accumulation of animal bones at the Spanish sites of Torralba and Ambrona, and stresses the comparatively high quality of the data from southern African cave assemblages analysed by himself, brushing aside Binford's recent criticisms of his interpretations of the Klasies River Mouth material. In the following chapter, Binford continues his inexorable efforts to reinterpret every well-known bone assemblage with a fairly standard hatchet job on the unfortunate Leslie Freeman (a former student of Binford's at Chicago) and his interpretation of Torralba as a site of human game-driving and elephant butchery. As one seems to find increasingly with Binford's offerings, his criticisms hit the mark and afford little scope for reply, but his own treatment of the data raises questions. He produces a new multivariate analysis of Freeman's published data and finds significant relationships between tools and species other than elephants, particularly equids. Like Klein, he also seriously questions the overall role of humans in accumulating the carcasses. But on p. 31 of Klein's chapter, we read that in Freeman's publication 'many bones had been incorrectly identified', and that 'it is doubtful that much culturally significant patterning could have survived the small-scale but cumulative transport of particles and often also of bones and artifacts across most of the occupation surfaces' (emphasis added). I make two points. First, Binford has stressed that we must interpret the dynamics of the past from the static archaeological record, but that record may well include the activities (and oversights) of the archaeologist, and reinterpretations based entirely on published information risk that problem. Second, what were the editors of the volume doing at this point?

Klein's theme, of the increased clarity of the Upper Pleistocene picture, is taken up by Straus in his chapter on the evidence for hunting in western Europe during the later part of that period. Geographic terminology is a little idiosyncratic here: his figure 1 shows a map that includes the area now occupied by the countries of the European Economic Community, but his evidence for hunting in western Europe is drawn from three bits of West Germany, a few patches of France, three areas of Spain and one locality in Portugal. Obviously, the evidence itself is clumped, but you surely cannot get a clear overall picture by only looking at the good bits.

Two interesting chapters, one by Frison, the other by Todd, discuss hunting by Palaeoindian communities in North America, and should be read together. Frison integrates his discussion of the archaeological evidence with details of species-specific behaviour, topography, ethnographic accounts and surviving traces of fences and catchpens, to give a graphic account of procurement tactics and meat handling activities. However, Todd then questions a number of assumptions inherent in such integrated approaches, arguing that things in the remoter stages of American prehistory may have been both different from and more variable than those of the immediate past. He draws particular attention to the palimpsest nature of many of the sites, and to the evidence of disturbance by non-human agents.

In the remaining chapter, Fisher considers whether Palaeoindian peoples of the Great Lakes area may have hunted or scavenged mastodonts (Mammot americanum (Kerr)), large members of a proboscidean family quite separate from that to which the elephants (including the better-known mammoths) belong. He presents an interesting discussion of the inferential problems involved, and brings data on sex, age structure and season of death to bear on the problem. The subject of the question is not as peripheral as it may appear since, if the people involved could hunt mastodonts, then we have some measure of their abilities, but the samples are small, and the presentation is overlong for its content. This fault is worsened almost beyond belief by an appendix on Bayesian inference applied to such a problem: the chapter itself runs to 112 pages, including references; the appendix alone accounts for 54 of them, and this is a book totalling 464 pages. Most of us have probably suffered the common complaint from journal editors that the manuscript is 'too long'¹. It is thus a little hard to rejoice in the sight of a book costing \$75.00 U.S. with such a massive waste of paper. In the preface we are told that chapters were reviewed: what were the criteria?

In sum: some interesting bits and pieces, and well worth a look at if you see it, but really overpriced.

Alan Turner

U. Körber-Grohne (1987). Nutzpflanzen in Deutschland; Kulturgeschichte und Biologie. Stuttgart: Konrad Theiss Verlag. ISBN 3-8062-0481-0. 490 pp., 95 figures, 132 pi. Price £29.50 (available post free from Oxbow Books, 10 St Cross Road, Oxford OX1 3TU).

Professor Udelgard Körber-Grohne has already produced several fine archaeobotanical books reporting material which she has studied - such as that from the Iron Age Wurt at the Feddersen Wierde, the Roman well at Welzheim and the Iron Age chieftain's burial at Hochdorf (reviewed in Circaea 4(2)). In addition to these, she has published extensively in journals. She has changed her tactics somewhat in the present book: although archaeobotanists will doubtless find it very useful, they should remember that this has not been written especially for them, this time - it is for a wide readership including biology students, natural historians and gardeners, although there will doubtless be some of us who also fall into some or all of these categories.

The book covers the range of useful plants that are now or were formerly grown in central Europe (and mostly also in Great Britain). Many are foods, such as cereal grains, pulses, vegetables and salad plants. Some imported plants such as chickpea are there, along with dyeplants, fibre plants and oilplants. The crops introduced from the Americas (for example maize, runner beans, tomatoes and potatoes) are also included. However,

fruit, herbs and most medicinal plants are omitted, sometimes with a sharp dividing line, so that leeks and onions are in, but garlic is out.

It is very important for a subject such as archaeobotany to be supported by good books which from time to time summarise developments from the mass of scattered periodical literature. The publication of Godwin's (1956; 1975) History of the British Flora provided such a landmark for Quaternary studies in Britain with each edition. There have been books covering the development of cultivated crops, Geschichte unserer Kulturpflanzen (Bertsch and Bertsch 1947) being an early summing-up of the results then available, but much has happened in the last forty years. Evolution of crop plants edited by Simmonds (1976), provided a more modern summary of the botany in an academic textbook, but certainly not the archaeobotany! Nutzpflanzen seems an excellent summing-up of archaeobotany in Europe to date. It should also usefully spread the knowledge of our subject and the accessibility of its results by such a clear and appealing presentation.

The treatment of each of the crops is a thorough account, but certainly not a catalogue of every single find. The discussion simply picks out relevant examples, an approach that does much to make the book readable. Of course the subject is making progress all the time, and the half-predicted find of the seeds of leek, for example, has now happened. Professor Körber-Grohne has also been selective in her use of documentary records of the plants, although there is a number of Huge German Books which have had to be quoted fairly often because, in characteristic fashion, their authors have left no stone unturned in an effort to be fully comprehensive - an example is the series by Becker-Dillingen on cultivated plants. The language she has used is straightforward, which naturally makes for readability; for those of us who find German difficult, it can be said that this is easy German compared with some.

The German view of some familiar crops is interesting: Professor Körber-Grohne herself writes that parsnips are only just now being grown in Germany, while of course they have long been popular in Britain. Celery to an Anglo-Saxon usually means the leaf-stems of the plant, but in Germany it is either the swollen root-base, celeriac to us, or the leaves. 'Rettich¹', the giant German radish, is not eaten here - for, after all, it is not sold in Sainsbury's, while Jerusalem artichokes (Helianthus tuberosus) seem unknown in Germany. The accounts of the histories of the various crops are very valuable, the more so because the examples given show that Professor Körber-Grohne has grown most of them in her own garden and so speaks from extensive personal experience.

I wonder how long the book took to prepare; the references generally go up to 1984 with a few 1985 ones where there were important new results (on dyestuffs, for instance), which were fortunately published promptly. All too often important archaeobotanical finds are made and generally known about, but actually published at a very leisurely pace if at all. Unpublished information has here been pursued where necessary, as in the case of Carthamus tinctorius (safflower).

The library searches have been most painstaking, both for the written word and, more importantly, for illustrations, which range from Egyptian wall paintings and classical coins through medieval woodcuts to paintings. Some of the botanical illustrations (especially the beautiful watercolours of Georg Oelinger published in 1553) are reproduced in colour, which adds greatly to the appeal of the book - indeed, it is probably worth buying for these alone. Recent plants are illustrated in excellent line drawings by the authoress herself - botanists somehow often seem to manage to do livelier drawings than professional artists. Only the maps were not drawn by her but they are good, with

suitably-sized lettering that is not interrupted by the lines of coasts and rivers. In addition, there are copious photographs (both half-tone and colour) of present-day plants and archaeological remains which were almost all taken by the authoress herself. I know from bitter experience how hard it can be to get a really good half-tone photo of a plant in the field, or a really crisp photo of a small fossil fragment, and to make the best possible print from it. These 132 plates are mostly very good, and must represent a huge outlay of time and effort, many seeming to be new ones done especially for the book.

There was an extra cost, too, for I gather that the Professor lost a Leicaflex camera during her travels! She journeyed to see wild ancestors of cultivated plants, to Italy for wild leeks, for instance, and to Israel for some of the cereals, while less exotic examples include the chicory growing beside a main road next to a traffic light in Tübingen. The standard of illustration makes the book the more informative, as one can get a real feel for the plants described that would not have been conveyed by mere words, and the pictures also make the book very attractive.

The publisher, Konrad Theiss is evidently keen on archaeology, producing many books as well as as the Current Archaeology-like journal Archäologie in Deutschland, all modestly priced by our standards. I like the thorough approach, so that Çatal Hüyük and Starčevo are correctly accented - can Circaea manage this? [We hope so - Eds!] I cannot believe that book production costs are any cheaper in Germany than they are here - the cost of living there is higher. Theiss Verlag shows that the slipping production standards and steeply rising prices of books from British and American publishers are, in my opinion at least, the result of the greed and inefficiency of those who supply the largely captive academic book market in the English language - they know the universities will buy, and do not care about the private buyer. How, otherwise, could our new British flora, a book not very much larger than that under review, and with only a few line drawings, cost more than twice as much and have such a catalogue of mistakes?

Nutzpflanzen in Deutschland is an excellent book in many ways, and it ought to appeal to many people since it brings together archaeobotany, crop science and gardening history in such a readable way, but sadly German is not much taught in Britain (I myself learnt not one word at school) and this will limit its appeal here and in other, similarly neglectful, countries. Another German classic work is to be published in an English edition (Ellenberg's work on vegetation of central Europe), but what (high) price will the English publisher charge? Professor Körber-Grohne's book is very firmly based on Central Europe, but an English edition might also be worthwhile not only for botanists (inasmuch as they still exist), but also for this nation of gardeners. It is by far the best Allium - Zea to appear so far.

References Bertsch, K. and Bertsch, F. (1947). Geschichte unserer Kulturpflanzen. Stuttgart,

Godwin, H. (1956; 1975). History of the British Flora. (1st and 2nd edns.) Cambridge: University Press.

Simmonds, N. III. (ed.) (1976). Evolution of crop plants. London & New York: Longman.

W. Groenman-van Waateringe and L.H. van Wijngaarden-Bakker (editors) (1987). Farm Life in a Carolingian Village. A model based on botanical and zoological data from an excavated site. Studies in Prae- en Protohistorie 1). Assen/Maastricht, The Netherlands & Wolfboro, U.S.A.: van Gorcum. viii+129pp., 23 tables, 22 figures, 17 plates; 37.50 Hfl. (paperback). ISBN 90-232-23217.

I must declare my general feelings about this book at the start of this review lest the criticisms that follow lead the reader to believe I did not like it. On the contrary, I like this book very much: it is just the kind of thing that I wish was coming out of environmental archaeology in the U.K. With the exception of the York Archaeological Trust fascicules and one or two other notable publications, we seldom see anything like this being published. This book is a multi-disciplinary environmental archaeological study of a medieval village in central Netherlands. The work emanates from the Albert Egges van Giffen Instituut voor Prae- en Protohistorie (IPP) of the University of Amsterdam and is the first of a series this institute intends to publish.

The book is in English, the text having been translated from the Dutch in part by the authors and in part by (?)professional translators. There is no reason given for choosing to publish in English, but one may assume that the U.K. and American markets were in mind, especially as the publisher has an American branch. Whilst the standard of the English is generally very good, there are some oddities and a very few mis-spellings (the worst of which appear in Table 3.5 where 'Length¹', which is used twelve times, is spelt 'Lenth' twice and 'Lenght¹ once - more a case of poor editing than mis-spelling?). It must be said, however, that having chosen to publish what is intended to be an academic book of high standard, the chosen language should be impeccable. One wonders why the editors did not ask some of their English friends and colleagues in environmental archaeology to check the text through. These quibbles aside, English readers are lucky to have this book so accessibly presented.

The study is based on the excavations of a village in the Veluwe by the IPP (1965-66; 1971-197A; 1977-1980). Evidence of activity from the Neolithic to the medieval periods was recovered, and this book is concerned with the 8th to 10th century settlement of Kootwijk 2 (A.D. 750-1000). There is a preface, and seven chapters covering botanical (pollen and plant macrofossil) and zoological (vertebrate) remains, and chemical (phosphate) analysis. Some of the analyses were completed many years ago and as a result some of the methods employed are (as admitted by the authors) out of date. The bone analysis and the experimental archaeozoology were completed in 1979, the phosphate analysis in 1980.

In the preface, H. A. Heidinga, the director of the excavations, brings out the valid and potent criticism that the different specialisms within archaeology have their own jargon, and this may sometimes serve to obscure rather than illuminate (p. vii). Although there is a defence for dealing with the minutiae of the analysis in specialised terminology, the 'lay¹ reader will tend to skip such sections, and may thus fail to appreciate some of the weaknesses of the analyses or the evidence; they may thereby fall into the trap of using the analysts' general conclusions too uncritically, thus leading to the kind of faux pas so aptly described by J.-P. Pals in his introduction to Chapter 7 (p. 118). Heidinga goes on to point out that one (perhaps the best) way of overcoming such 'hitches in communication between "culturalists" and ecologists' is the inter-disciplinary approach, such as adopted for the Kootwijk project. This is indeed a truism, but it requires restating because this approach is still the exception rather than the rule.

The introduction describes the archaeological background to the site, highlighting the period and the features upon which the environmental analyses are focussed. The 10th century saw a turning point in agricultural economies in the region: cultivation of summer

and winter cereals which had been restricted to dry, loamy sands before this time, afterwards spread to low wet regions such as the Veluwe. At this time the development of sod-manuring took place on the better soils (creating the plaggen soils). These changes were apparently partly triggered by the dry period of hot summers and cold winters experienced at this time which encouraged the move to the moister soils. In the Veluwe this change occurred at a time of drastic alteration of the landscape into desert, so that by the 11th century sand drifting had become a major threat (by the 19th century 20% of the area was rendered infertile). The major contributor to this deterioration appears to have been the iron industry for which deforestation occurred in order to obtain charcoal. The Kootwijk settlement, therefore, spans the period of the early and radical changes described above.

The introduction ends with a two-page reconstruction of what life in the village may have been like ('A day in the life of ...'). It seems a pity this was not further enhanced by a reconstruction drawing, but the text alone serves to give a vivid, if somewhat simplified and perhaps naive, picture of the settlement.

The chapter on pollen analysis is by B. van Geel and 111. Groenman-van Waateringe. In common with the other analyses, the methods and samples are described in great detail. This is, perhaps, a major weakness in the book, because some of this detail seems unnecessary. In this chapter, for instance, there are three pages of sample descriptions of which the following is a typical (short!) example (from p. 14); 'A12 = P 1974-53-55, cutting LIV, E section. 55 Ao or A1 layer, 53-54 ploughed yellow-brown drift sand.¹ Similarly, in Pals' paper on the macroscopic plant remains (Chapter 4) there is a seven-and-a-half -page inventory of the plant remains (pp. 80 ff.). This kind of detail is not required and is surely archival material. If deemed absolutely necessary for publication, then this kind of information would ideally be suited for microfiche. Not only does it unnecessarily increase the length (and cost) of the publication, but it actually detracts from the interest of the rest of the analysis. The conclusions reached by the authors are that the area surrounding the settlement was almost completely lacking in woodland, with the vegetation surrounding the cultivated fields comprising grassy heather. The pollen also picked up many of the weed species seen in the macroscopic remains, these being mainly characteristic of winter cereal fields.

The vertebrate remains, reported on by G.F. IJzereef, comprise only 1356 fragments plus a partial horse skeleton. Four hundred and sixty of the fragments are unidentified, so the assemblage is 896 identified bones (given as 996 in the text) which represent a 250-year period (3.6 bones per year!). Whilst most bone analysts take it for granted that the typical bone assemblage is but a tiny fraction of the original population of animals represented, many are agreed that samples as small as this are of very little value for interpretations about site economy. The small sample is the result of the poor preservation conditions within the sandy soil. Apart from the horse skeleton and a special deposit of pig mandibles, therefore, there is little point in taking analysis of the bones any further than a bone count table (table 3.1). The conclusions drawn (pp. 48-9) are reasonable precisely because they are unexceptional. However the analysis should have dealt only with the two special deposits; the sample is too small for anything more. The two special deposits are described and tables of measurements and age determinations (for pig) are provided. No attempt is made to offer any explanation for the unusual horse burial (in which the hind limbs were broken, possibly to facilitate the burial) other than

calling it an 'emergency burial' whatever that means. Horses would presumably have been expensive and high status animals, so surely this burial was of some significance. The pig mandible deposit is taken up in a later chapter, the present one being content to deal mainly with description. The conclusion, based on this deposit, that there was 'an emphasis on pig breeding in the local rural economy and consequently on pork in the diet' (p. 49) is surely wrong-headed - were several such deposits discovered it might have been more reasonable, but here we are merely seeing a cache from a single event which should not be used to make general statements about the economy.

The longest chapter in the book (43 pages, including the plant inventory mentioned above) is that by J.-P. Pals on the macroscopic plant remains. This reflects the importance of this category of evidence in terms of details about the economy and environment of this site. Both charred and waterlogged remains were recovered, and Pals compares these both in terms of the range of information they provide and the types of feature in which they occurred, noting the important point that the different sources have different implications. He points out that carbonised material will highlight weeds that were present in the fields, whereas the waterlogged remains (from wells) will mainly reflect ruderal situations (p. 75). The comparison shows nineteen species that occur in waterlogged samples only and seventeen only as carbonised remains; a further 30 species are represented in both types of material. Thus the field weeds are characterised by (1) plants of poor, dry sandy soils; (2) plants of loamy soils. There are also nitrophilous plants present. He concludes that manuring was carried out, with most arable cultivation on the sandy soils, but some loamy soils being utilised.

On the basis of the evidence of weeds, Pals refutes the original suggestion that a three-field rotation system was practised: the perennials of phytosociological class Artemisetea are scarce, but would be expected in such a rotation system. He postulates that the fields near to the settlement were intensively cultivated and an infield-outfield cultivation method was employed.

The cultivated species include a wide range of species with rye, oats and barley prominent, plus a range of fruits, and species such as horse bean and flax. Various damp grassland species are present, and Pals takes this to represent hay gathering from stream valleys 6 km or so distant. Progressive drying-out of the pool area of the site is indicated by the 'eutrophication'¹ of the plant communities through time. The chapter also includes a useful description of the region's soils, present-day vegetation, forest history and ecotopes based upon these.

The phosphate analysis by H. Kamermans leaves the reader feeling that this was a lot of work for little payoff. The results from samples taken within the settlement and from the fields were compared with control samples from undisturbed podsoils. Generally speaking there was no significant difference between the archaeological samples and the controls. This is partly because there were no house floors preserved and partly due to the fact that a characteristic of podsoils is the leaching out of bases. Since both these facts were known before the analysis took place, one wonders why such work was carried out. One item of interest, however, does emerge: phosphate levels were higher than average on the western sides of some of the houses. This may be a result of cleaning activities (the wall areas retaining greater amounts of phosphate) or a factor of the building structure (wattle and daub walls?). The author also suggests that manuring was not practised, although he admits that these deductions could not be substantiated statistically. The most telling sentence is the last: 'A pedological study undertaken at an early stage would have clarified the migratory tendency of phosphates in these soils and would have confirmed the limited value of phosphate analysis ... under these circumstances' (p. 105).

The chapter on experimental archaeozoology by L. H. van Uijngaarden-Bakker is a useful piece of work, both in the summary of experimentation in this field (pp. 107-8) and the actual experiment in question. The problem was the interpretation of the butchery marks observed on the cache of pig mandibles mentioned above. These all had part of the ventral margin of the horizontal ramus removed. Two sows' heads were butchered by a

professional butcher. The first was treated for removal of the tongue and masseter muscles, and the mandibles were then separated from the skull. After this the ventral margins were chopped into, revealing a rich source of marrow. The last process was difficult with the mandibles separate from the skull, so the second skull was treated with the mandibles left attached until after opening the marrow cavity: a much easier job. Whilst the reason for the butchery seems obvious, this is a useful experiment because it does show the sequence of events that probably occurred. The discussion of the deposit is also interesting. The similarity of the butchery, the fact that the finds were in a single group, and the small age spread (27 ± 3 months) indicate that this was the work of a single person, and it is postulated he was a travelling butcher who had visited the site around the month of November. The mandibles represent twenty pigs, and if this was the number of farms (not unreasonable from the archaeological evidence), then the ratio of one pig per farm hardly represents the emphasis on pigs postulated by IJzereef.

The final chapter is an interpretation of the economy of the settlement by J.-P. Pals. He divides his discussion into sections on agriculture, stock-raising and manuring before bringing these together for his model of the economy. This reader was somewhat confused by the fact that a detailed series of calorific (and related) calculations were made, but the results were not very fully or critically employed. Furthermore, the wide error margins (admitted by the author) would be wider still when the evidence is combined. Having said this, the picture he presents - of a settlement well able to support itself - seems entirely reasonable.

In conclusion, the main drawbacks of this book are: (1) too great an attention to detail in some cases; (2) too uncritical an approach to, and acceptance of, some methods of analysis. Its strengths are that it is clear and intelligently presented. It provides more than enough data for other environmental archaeologists to use, but is written so that it should be accessible to 'non-environmentalists'. One rather doubts whether all the categories of reader listed on the back of the book would benefit from it, but to this reader, its main facilities are that it shows how environmental studies may combine with and enlarge upon other strands of environmental evidence, and (it is to be hoped) in a way that will convince non-environmental archaeologists that this kind of integration is the right approach.

Bruce Levitan

K.-E. Behre (ed.) (1986). Anthropogenic indicators in pollen diagrams. Rotterdam, etc.: Balkema. 232pp., 4 pis with other photographs and figures in the text. £19 to AEA members (see Newsletter No. 19, January 1988). ISBN 90 6191 673 9.

The background to this volume was a conference held at Wilhelmshaven in 1985 on signs of human activities in pollen diagrams, and the papers that were presented are published here. The people invited there were part of an INQUA working group that was established in 1982, and I believe the seventeen who gave papers were all who attended; it was not an open invitation conference. Even though the organisation of a conference may necessarily limit numbers, it seems a pity that a few more could not have participated; I can think of

palynologists in most countries of northern Europe who could probably have made valuable contributions or at least benefited from the discussions. Still, we can be grateful that the results have been published so quickly and at a reasonable price.

Twelve of the papers are in English and cover Dutch, British Scandinavian and East European results, while the rest, covering the two Germanies are in German. Switzerland and Austria are not represented here (in view of the high Swiss and Austrian 'productivity', this must be a result of 'low pollen transfer'). There are twenty-two pollen diagrams inside the back cover as well as some more printed with the text, perhaps not surprisingly, although I fear that the loose ones in the pocket may get 'lost' from library copies. My overall impression is that many of the papers were longer than they need have been (at least for this reviewer), at around 20 pages; the writers would probably disagree. The strict limit imposed by van Zeist and Casparie in Plants and Ancient Man (hereafter referred to as PAM) made for generally shorter papers, but I know myself the difficulty of trying to write a compact article.

The volume is arranged geographically. Starting with Scandinavia, the areas where there is evidence for indicators of human activity include northern Norway, where the small flora allows good indication to be had from barley, Spergula, Rumex acetosa and Ranunculus acris types, for instance, and Juniperus. Kaland discusses whether the coastal heaths of Norway were the result of man or climate, a bald statement covering an excellent paper. Berglund et al.'s results from south Sweden are on the interpretation of pollen diagrams with the aid of modern spectra from particular stands of vegetation, clearly concluded. Finnish results, in a well-written paper by Vuorela on the evidence for forest clearance, should have some relevance to studies on the earliest clearance here, and Vasari discusses evidence of flooding for haymaking, which was the practice in Finland. Trees in Denmark are discussed by Aaby in a detailed paper which shows what can happen when research resources are concentrated on a subject area.

The German papers have been thoughtfully provided with extra-long English summaries done to a high standard of technical writing. Behre and Kucan report on a particular settlement area in north Germany between the rivers Ems and Ueser in great detail, comparing the evidence for settlement at varying distance from the pollen sites, both kettleholes and mires. Beug has carried out a similar study of an area near Göttingen, but he concentrates on the Early Neolithic. Perhaps not surprisingly, for one who has done such detailed work on cereal pollen identification, much of his effort was directed to cereal pollens as indicators of settlement. Pott presents results of investigations into human activities in the area between the Ruhr and the Rhine, where woodland was managed along with cultivated fields in a distinctive way. Willerding compares the results from macrofossils with those from pollen analyses.

It was particularly valuable to have contributions from East Europeans because it is difficult for them to travel to the west. Lange has studied pollen in settlement ditches in East Germany; Rybníček and Rybníčková summarise results from medieval sites in Czechoslovakia, and Wasilikowa compares macrofossil and pollen results from Poland.

Geographically somewhat on the fringes of 'Central Europe', Groenman-van Waateringe has studied the evidence for grazing land in pollen from modern assemblages and from buried soil surfaces, and Janssen present some of his results from the Vosges mountains in France. Our islands come last (I would have thought we were nearer to Scandinavia, geographically at least), with Peter Moore and associates writing about man-made changes to water regimes, ideas which seem to be gaining general acceptance, if one can judge from

the fact that they are widely quoted; I suspect macrofossil studies might solve some of the problems of being unable to differentiate species within the indicator pollen taxa Potentilla and Melampyrum.

There is an enormous amount of thought and detail in the papers, which makes it quite a daunting task to get to grips with it all. They vary quite a lot in how much they discuss anthropogenic indicators in the strictest sense, i.e. the question of how to detect them in the periods and regions in question. Some papers seem rather more regional studies with human influence as a sideline. The standard is generally high and some very good, formal English (which many of us would have to try hard to emulate) has appeared from non-native speakers. Seven of those whose papers appear here also gave papers at the cultural landscape conference in Norway a year later, and a certain overlap of subject is evident from some of the summaries from the latter, but maybe the final publication of Cultural Landscape (due out some time this year) will deal with rather different aspects of the results in each publication.

Often one can at least get an idea of the source of some of the pollen types from macrofossils, and in small sites plenty more, yet, surprisingly, few papers acknowledged this as a source of information. Of course beetles are another source of evidence about man-made change (the only one, according to some!) but that opinion naturally reflects my own personal interests. To carry on the comparison between pollen and macrofossils, it has seemed to me that palynology as a subject is unfortunate in lacking regular meetings that there are for those who work on plant macrofossils (both in Britain and, internationally, at the IUGP. Such meetings and discussions there are of immense benefit.

Editing, I gather, is a matter for national custom. While, here in Britain, an editor would often send out scripts for referees' comments on all aspects of a paper, and perhaps be able to make some improvements themselves, the conventions overseas are different, and these papers seem to be as the authors typed them. The English terminology used varies from country to country, with terms which are not in general use here such as 'apophytes' used for weeds, and even the extraordinary 'ergasiophyte' for a crop, presumably. Maybe such terminology needed some unification, or even explanation, as such words can be in few dictionaries. At least we were spared the extremes of palynologists' jargon, 'pollenese', and I happily found no 'spatial and temporal inferences' anywhere.

On a technical note, the arrangements for providing camera-ready script as with PAM seem to have been generally successful. Behre's and most of the other contributions were originally typed in something very like Courier 10, perhaps on advice from Balkema, and after reduction they were still clear. However, Beug and Turner both used less readable typefaces, which were uncomfortable to read when reduced in the publication. Kaland used dot-matrix printing for the text and likewise Berglund's Apple Macintosh computer graphics were not a complete success, as fuzzy writing is tiring to read at this size (sorry AEA newsletter). When is desktop publishing with computer and laser printer going to appear on the archaeobotanical scene and give type that looks printed? The A4-sized pollen diagrams were a great improvement on the usual enormous fold-outs, and were mostly readable. As with PAM, the book is well bound and good value. Photographs are mostly included in the text now, although some were a bit small and muddy.

In conclusion, there is much useful information here, and it is well presented. This is obviously near to the state of the art - or is it a science - of palynology. But buy a copy soon; PAW has already been remaindered!

James Greig

E. Roselló Izquierdo (1988). Contribución al Atlas Osteológico cte los Teleósteos Ibéricos 1. Dentario y Articular. Madrid: Ediciones de la Universidad Autónoma de Madrid (Colección de Estudios 16). 308pp, 196 figs. ISBN 84-747-71447. 2,900 ptas (about £15 or \$30 US).

This is a book notice, rather than a review, because the text of this book is in Spanish, which I do not read. In common with many treatises on bone studies, however, sense can be made of the text even if one does not read the language, and the present book is no exception, especially as it is profusely illustrated with finely executed line drawings (the 196 figures often include two or more such drawings, and there is hardly a page without an illustration).

The author carried out the work upon which this book is based for her thesis. The book is partly bone atlas, partly analytical morphology of dentaries and articulars of fish. It is divided into six sections, the first and last being an introduction and conclusion respectively.

Section II is a description of the material and methods. No fewer than 96 species of fish have been covered, from 40 families and 15 orders. Some 144 specimens were examined, which means that most species were represented by a single specimen (there is a list of species and number of specimens examined). The more common species have had two or more specimens considered (e.g. trout (3), hake (2), scad (8)), but other important species such as cod, eel, and flounder have had only one specimen examined. There are also some omissions that are serious for the British analyst, though possibly not for the Spanish - e.g. ling (though even Spanish ling is not considered), herring and haddock.

The body of the book is contained in Sections III (dentaries) and IV (articulars): the atlas/morphological comparanda. This occupies 184 pages, with 192 figures. There is a useful introductory piece for each section, mapping the location of the elements, giving a detailed labelling (in Spanish), and a very good diagrammatic illustration of the main forms encountered (e.g. showing five basic teeth patterns: incisiform, caniniform, molariform, cardiform and coniform). Points of measurement are also shown, followed by a list of the species with their measurements and typical size categories. The line drawings in the atlas section are superb, and most figures show the lateral and medial surfaces of the bones. There are 86 pages (95 figures) devoted to dentaries and 69 pages (89 figures) for articulars. Each species is described, and the main characteristics of identification/difference from other species are given.

Section V is a quantitative analysis of the identification characters described in Sections III and IV. There are 39 tables of comparative listings and six statistical plots of the amount of separation encountered in different factors. The characteristics and species combinations used for each of three factors are listed, and plots of factors I/II, II/III and I/III are given. This section is the most problematic for non-Spanish readers, as the description and analysis of the statistics are central to an understanding of the plots, but a sense of the results can nevertheless be gained, with the more obvious species similarities being listed for each plot.

At the price of 2,900 ptas (which may include postage) quoted above, this book is very good value. Enquiries about it should be addressed to Librería de la Universidad Autónoma de Madrid, Cantoblanco, E 28049 Madrid, España, Telex: RCUA E, from whom it can be obtained.

Bruce Levitan