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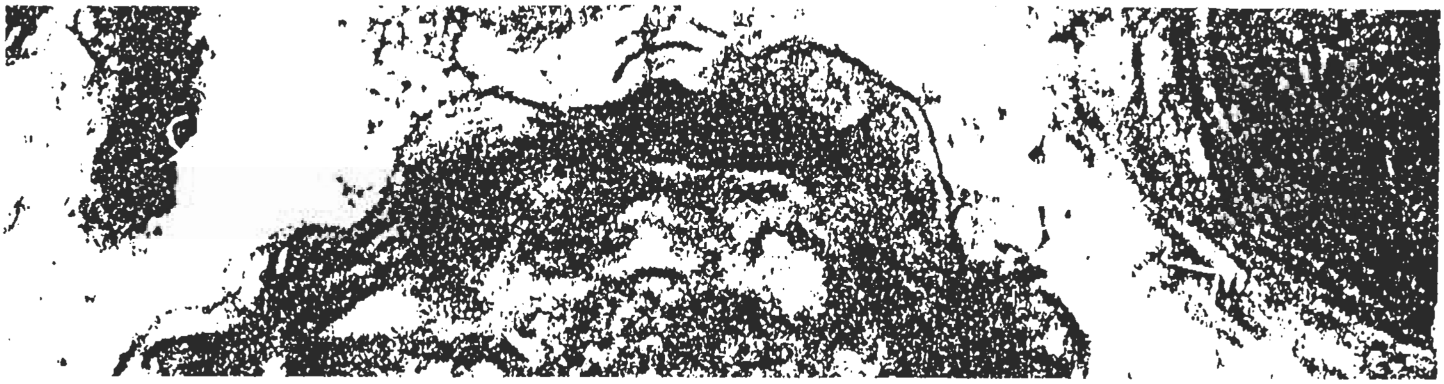

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circaea

The Bulletin of the Association for Environmental Archaeology

C I R C A E A

CIRCAEA is the Bulletin of the Association for Environmental Archaeology, and - as from Volume 4 - it is published twice a year. It contains short articles and reviews as well as more substantial papers and notices of forthcoming publications.

The Newsletter of the Association, produced four times a year carries news about conferences and the business of the Association. It is edited by Vanessa Straker and Bruce Levitan, to whom copy should be sent c/o B. M. Levitan, University Museum, Parks Road, Oxford, OX1 3PW.

Editorial policy for Circaea is to include material of a controversial nature where important issues are involved. Although a high standard will be required in scientific contributions, the Editors will be happy to consider material the importance or relevance of which might not be apparent to the editors of scientific and archaeological journals, such as papers which consider in detail methodological problems like the identification of difficult bioarchaeological remains.

Circaea is edited and assembled by Allan Hall, Harry Kenward and Terry O'Connor, at the University of York. Circaea is distributed free to members of the AEA and available to institutions and non-members at £9.00 per annum. Back-numbers and a limited supply of articles can be purchased at the following rates: back-numbers (vols. 1 and 2, and vol. 3, no. 1) - £2 per part; (vol. 3 no. 2 onwards) - £3 per part; articles - 5p per side, plus postage.

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EDITORIAL

Do you have a pet theory or piece of received wisdom that you love to hate? Why not write about it for pleasure (but not profit) in Circaea? The Editors wish to produce an issue devoted to 'iconoclasm', to give contributors an opportunity to express their misgivings about, or downright disbelief in, some of those cherished theories and practical methods that appear to have stood us in good stead for years. We wouldn't want to encourage criticism for its own sake, but a forthright though constructive reconsideration of old ideas can only be refreshing and productive. Short contributions will be welcome, as well as longer, more formally structured papers.

As many of you will already know, a new journal has appeared in recent months - Archaeozoologia - published by La Pensée Sauvage, and edited by Pierre Ducos at Bordeaux. At Prof. Ducos' suggestion, the Editors of this journal have agreed to exchange copies of each issue of Circaea and Archaeozoologia and to reproduce in each summaries of papers published in the other. (This, of course, makes it more imperative that our contributors supply a summary!) Despite its name, Archaeozoologia is thus far devoted entirely to papers about bones. Those who work on invertebrate remains in archaeology should obviously be encouraged to offer contributions to it, to prevent it becoming yet another 'osteocentric' publication.

Many others of you (probably not the same group) will be aware that 'CTW' (Flora of the British Isles) has reached a third edition (published by the Cambridge University Press in May this year, and now authored by Clapham, Tutin and Moore). It costs a staggering £65 (staggering, considering its potential sales) and, although now in a somewhat easier-to-handle format, one family is completely missing from the text. OK, so it's only Zannichelliaceae - about half-a-page's-worth - but one might have expected better. This is not simply a minor omission, since all subsequent families are misnumbered - and do not therefore tally with the Synopsis of Families at the front of the book, where Zannichelliaceae is listed. One wonders whether 'CTM' will be dumped in a few years' time like Godwin's second edition 'HBF', when the cost of storing over-priced tomes outweighs any profit CUP are likely to make!

Following a comment from a reader, we must set the record straight by revealing that the Sherlock Holmes parody in Circaea **4**(2) emanated from Philippa Tomlinson, although most people probably guessed! Michael Ryder also wrote in response to this piece - more of that below. This kind of mischief draws forth a mixed response, but on the whole we would prefer to encourage humorous articles providing that they have a serious underlying point.

Last, but certainly not least, the Editors would like to thank Kate Watson and Tracy Painter, employed at the Environmental Archaeology Unit on a Manpower Services Commission Community Programme scheme, for transferring most of the copy for this issue of Circaea from typescript to floppy disk.

Front cover: The warty-shelled egg of the maw-worm, *Ascaris* (probably *A. lumbricoides* (L.). Based on an original photomicrograph of a fossil specimen from Lindow Man, by Dr A. J. Wilson (Department of Biology, University of York).

MISCELLANY

Environmental archaeology at Khok Phanom Di, Central Thailand: an update

Much progress has been made since my first report on this site was submitted for publication in 'Miscellany' in these pages last year (Circaea, **4**(1), 8-10). The archaeological stratigraphy of the midden (using the term very loosely) can be divided into Zones A, B and C (working from the base upwards) for the purposes of generalized description and discussion, and of these Zones B is now covered by five radiocarbon dates from the Lower Hutt laboratory in New Zealand, ranging from c. 3000 to 1500 B.C. The error terms, ranging from ±150 to ±820, are larger than one might desire but since the datings were obtained free of charge one can hardly complain! The Australian National University will have begun dating samples from Zone A (expected to range in age from c. 4000-3000 B.C.) in July 1987, and ten samples from pollen cores KL2 and BMR2 (collected north of the site) are currently being dated on the accelerator at Oxford.

Gillian Thompson has just finished a second period of fieldwork in Thailand as I write (April 1987), aimed at collecting plant material from mangrove and other environments to identify the plant macrofossil remains. She has been working at the Institute of Archaeology, London, during July 1987, extracting material from the coprolites.

Five of the larger coprolites were sent to me first so that I could extract what I needed for pollen analysis. These were all calcified and absolutely rock hard. I scraped out sufficient material from centre of the very largest and prepared this using hydrochloric acid, then a weak solution of tetra-sodium pyrophosphate followed by routine methods. It proved to be poor in pollen but had some phytoliths, monocotyledon leaf fragments and microfossil charcoal. There was nothing there to identify it positively as of human origin or to give much information of any value at all. I have sliced small sections out of the four other coprolites but need to find more information on preparation methods before proceeding any further. If anybody has any information or ideas about treating calcified coprolites I would be very pleased to know.

The large monolith from the sidewall of the excavation mentioned in the previous report is now in New Zealand with Prof. Higham and is being examined by a geologist as part of a PhD project. This is most fortunate as we did not have a geomorphologist with us as a member of the fieldwork team. I had intended to work on the phytoliths but a report by Pearsall (1986) based on phytolith analysis of samples from excavations in the Philippines, rice field soils and modern reference material of numerous locally collected plants, including rice, suggests that this technique is fraught with difficulties for South-East Asian work at least. Fujiwara is cited elsewhere (Rovner 1984, 3) as claiming that he can not only identify rice phytoliths from Japan but those of associated grass species so that comments on the type of cultivation can be made. Pearsall confirmed that rice produced distinctive phytoliths but those did not occur in the rice field soils which she studied or in samples from the excavation. She also discovered that some grasses have both the typical Panicoid and Chloridoid forms of phytolith present. So my work on phytoliths has, at least for the time being, been curtailed. Although the problems associated with pollen analysis are legion, it is a tried and tested technique capable of yielding useful results.

In all, four pollen profiles from the near environs of Khok Phanom Di are now available and research is progressing upon a fifth. Three of those already completed are from north of the site, as is the one (KL6) which I am currently working on. The one from south of the site (JB2) was prepared by Judith Brown. She has also analysed another two from areas west and south-west of the site and within a 10 km radius to provide some rudimentary perspective of regional variation in the lower Ban Pakong valley. Unfortunately she has now left The Queen's University of Belfast, deterred by the diminished employment prospects in the academic world, and might not write up her findings for a degree. This would be a great pity as she has put in considerable effort on the laboratory work. Nevertheless semi-detailed reports on core JB2 and my core KL2 have been prepared (Maloney and Brown in press), as well as on cores KL2 and BMR2 (Higham and Maloney in press). Nothing has been published on core FP3 yet but this does not differ greatly from BMR2, and core KL6 looks, from the first few pollen counts, as if it, too, is going to be similar, with Rhizophora and Bruguiera comp. dominating the spectra until late in the record when Ceriops sim.(possibly indicative of tree-dominated freshwater swamp or lowland dryland forest) increases, followed by an increase in grasses. JB2 differs in that it has a high Rhizophora content but very little Bruguiera in most samples.

Grass pollen rises earlier at KL2, which is located nearest to the site, and some consistency in the microfossil charcoal peaks of the various cores tends to suggest that the vegetation was burnt off before initial occupation of the site and in association with the increases of grass pollen. The lower 15-20 cm of the archaeological stratigraphy was very rich in charcoal and a sample from the 'natural' contained macro- and microfossil charcoal but no pollen or phytoliths. Some of the grass pollen has the right size and surface patterning to be from rice but it is impossible to be as sure as Tsukada et al. (1986) have recently been for material from Japan, where the number of grass species present in the local vegetation is likely to be lower and rice was growing on the site in question (Ubuka Bog in south-west Honshu). One thing that is almost certain is that, while rice macrofossils were present at our site from the very base of the archaeological record, the pollen evidence suggests that it could not have been grown around the site until later prehistory. This is not to preclude the possibility that it had actually been cultivated on a small scale on the mound itself or that it was present as a wild plant (and collected) or under cultivation further inland. A core from the south-west edge of the mound contains bands of inwashed charcoal and it is hoped to subject this to pollen analysis in due course so that the record from this side of the site can be elaborated upon.

Ken McKenzie (Riverina-Murray Institute of Higher Education, Wagga Wagga, Australia) has kindly examined the sponge spicules, foraminifera and ostracods contained in some KL2 samples, and he reports that most taxa associated with the period of mangrove pollen dominance are of nearshore marine affinity but all those present can also be found in deltas and protected embayments. This at least confirms that the site was near the sea (it is now c. 20 km inland), if not surrounded by it. Cores BMR2, FP3 and KL6 have a high percentage of extremely corroded pollen which may indicate that the mangrove was not growing nearby but some distance inland from the site, which may have been an island in a shallow sea, although a similar pattern might be expected if it was a levée.

Amphan Kijngam, who has been working on the fish remains from the site, found that large grouper (Fam. Serranidae) were very frequent until Zone C. Groupers come into the estuaries at the start of the wet season and so are only available seasonally. Coastal species such as shark, ray and squid also occurred but a significant quantity of freshwater fish, of which small catfish were most common, were present throughout the several other places under aliases). Farm livestock remain anonymous. Gilbert White tells of a sagacious sow, incredibly multiparous, whose figure was such that she was unable to proceed to the boar on her own feet, but could summon the wheelbarrow in which she normally travelled on these occasions; however no name is mentioned. Perhaps if she had had one, her heartless owners would not have fattened her for slaughter when she finally became infertile in her mid-teens, and pronounced her very good bacon. True, there was a sow with a name, Slut, a highly skilled truffle hunter who was presumably required to come when she was called, and those medieval pigs that were employed as pointers in the King's Forests where dogs were outlawed must have had names. The members of a plough-team must have had names also, if only to swear at them properly - simple names usually based on some point of their appearance like the Somerset farm horses of my childhood acquaintance, Ginger, Whitefoot and the handsome, idle, " 'ave to get a braanch to 'ee" Boxer.

Blossom was an entirely different proposition. She made medical history. She was the cow who gave the cowpox to the milkmaid whose immunity to smallpox suggested the possibility of vaccination to Dr Jenner of Berkley. Her portrait was painted and adorns one of the walls in Dr Jenner's house, now an excellent little museum. Though portrayed in a pleasant rural background, the awkward stance of the beast suggests that she had been stuffed. She was an ordinary cow of the Gloucester breed, of modest milk yield but a regular calver. She seems to have been allowed to die of old age, and the only peculiarity about her (not borne out by the portrait) was that souvenir hunters managed to collect 3 pairs of horns from her. Those preserved in the museum are not those in the portrait.

Barbara Noddle

Following a semi-serious piece in the last issue of <u>Circaea</u> concerning the recognition of modern contaminants such as cigarette filters in archaeological deposits, Dr Michael Ryder has written to remind us that he published an article in <u>Antiquity</u> in 1974 (Vol. **48**, p. 6) with a similar sentiment; we reproduce it here, with the permission of the author and of the Editor of <u>Antiquity</u>:

<u>Belgic cotton, or don't dig and smoke - a cautionary tale</u>

Some time ago, I received from a Belgic excavation that shall be nameless some fibres from what had appeared to be some wool with two cut ends suggesting a "double-cut" made while the fleece was being shorn. It was thought that this might throw light on the introduction of a white, fine-woolled sheep into Britain.

My first reaction to the white colour with the naked eye was that the fibres appeared to be flax, since even non-pigmented animal fibres usually have yellow discoloration. Also the fibre length was too regular to represent a "double-cut" from a fleece.

Under the microscope the fibres appeared twisted like cotton, but had the pigment that is added to de-lustre synthetics. Also the diameter distribution was too uniform for wool. Another expert I enlisted thought the fibres might be silk, and at this stage since the sample clearly was not wool (my main interest) I withdrew from the investigation through lack of time.

The fibres were then sent to a textile testing laboratory which confirmed my suspicion that material was a modern synthetic, and identified the mass (which I had not seen in its entirety) as a cigarette filter.

Amusing as this may be, it wasted an appreciable amount of several experts' time, and strikes at the very roots of archaeology. If such a large object as a cigarette end can creep into an excavation un-noticed, what hope have we that really small finds such as insect parts are not modern intrusions?

It appears that archaeological excavation needs a form of hygiene akin to that in food preparation if not that of the surgical operation. Is it too fanciful to suggest that the archaeologist will one day, like the surgeon, work through a "drape" so that only that part actually being excavated is exposed?

Dr Ryder also informs us that he has moved to Southampton; his new address is 4 Osprey Close, Southampton SO1 8EX, U.K.

Archaeozoologia - A new scientific journal

Archaeozoologia, a new periodical whose first number has recently appeared, has been established in response to the need for an international journal for archaeozoology. Entirely devoted to this subject, it will be of interest not only to archaeozoologists, but also to other archaeological scientists, to archaeologists and to zoologists.

The first number (two will be published each year) is devoted to the publication of the papers given at the Fifth International Congress of Archaeozoology, which took place in Bordeaux last August. These papers, more than one hundred in number, cover a wide range of topics, including taphonomy, seasonality, domestication, etc., and provide an invaluable survey of current research in the field.

Hereafter, Archaeozoologia will become an international forum for zooarchaeology, publishing papers, notes and reviews. Most of the papers and other contributions will be in English, the remainder in French with detailed English summaries.

The following papers and (English) summaries (rendered exactly as in the original) appeared in the first issue of Archaeozoologia:

A revision of the faunal remains from two Central Sudanese sites: Khartoum Hospital and Esh Shaheinab

Joris Peters

Comparison of the fauna from two Central Sudanese sites: Khartoum Hospital (KH; 8 000 - 7 000 B.P.) and Esh Shaheinab (ES; 6 000 - 5 000 B.P.). Hunter-gatherers from KH are compared with pastoralists from ES with large and small livestock (goat sheep) and dog.

The faunal remains of Paso in Northern Sulawesi, Indonesia

Aneke T. Clason

A study of bone remains of a shell-mound of approximately 7500 B.P. occupied during 3 to 500 years. The principal species are Sus celebensis and Anoa depressicornis. A description of the bone remains and comments on the diet of the human group.

Vizcacha (Lagidium viscacia) and Taruca (Hippocamelus sp.) in early southandean economies

Guillermo L. Mengoni-Gonalons

The bone remains from a cave of northern Argentina (9 900 to 9 200 B.P.) are described and the subsistence strategies on both sides of Andes are compared.

Buffer resources and animal domestication in prehistoric northern Chile

Brian Hesse

The author, referring to Wilkinson's definitions, attempts to join the frequency of buffer resources with the domestication process using data from of 11 sites in the region of the salar Lake de Atacama (Northern Chile, 11 000 to 2 500 B.P.).

The incidence of these resources is low in the sites of hunters and high in the sites of breeders. Their exploitaton is a sign of an evolution toward domestication.

Variations of tooth size of moose (Alces alces L.) during six millenia in Northern Sweden

Elisabeth Iregren

An example of how a mammalian species may vary biometrically during different climatic conditions

The dimensions of the teeth of todays' moose are compared with those of prehistoric moose (4 500 to 2 000 B.C.). The decreasing size of the moose since the climatic optimum is confirmed.

The Prejlerup Aurochs - an Archaeozoological Discovery from Boreal Denmark

Kim Aaris-Sørensen and Erik Brinch Petersen

Discovery of an Auroch Skeleton at Prejlerup (North West Zealand, Denmark) in 1983, dating from 8410±90 B.P., associated with 15 microlithes. It concerns a very large male of 18-20 years of age. Nine to twelve arrows hit the animal, none of which were fatal.

New dates for old animals: the reindeer, the aurochs, and the wild horse in prehistoric Britain

Juliet Clutton-Brock

Summary of progress in a dating study of the Reindeer, the Aurochs and the Wild Horse with the goal to determinate the time of extinction of these species in Great Britain (7800 B.C. for the Reindeer and the Horse, Bronze Age for the Aurochs).

Remarques prèliminaires sur les chevilles osseuses des boeufs de l'Italie nord-orientale

Alfredo Riedel

The preliminary results of a study of the variation of horn-cores from the sites of Veneto, Friouli, Trentino and South Tyrol, dating from recent neolithic to the middle ages, are presented. The size at the withers decreases from the Neolithic (116 cm) to recent Bronze (106 cm) and increases again during the Iron Age.

Its maximum size is reached during the Roman epoch and decreases again in the Middle Ages. The size increase is less marked in the mountain zones of Tyrol.

The caracters of different horn-core ensembles are described. The differences at the same site, between the ox and the bull are extremely variable. The differences become important from the beginning of the Iron Age.

The form and dimension of horn-cores seems to be a good racial character. The relation between the horn-core dimensions and the size at the withers is not shown, nor the existence of different races in the same region, at the same time.

Introduction de l'Ane (<u>Equus Asinus</u>) au pays basque

Jesus Altuna et Koro Mariezkurrena

The history of the introduction of the donkey on the Iberic Peninsula is not well known

The oldest presence in Andalousie comes from sites in the region of Malaga (Uerpmann); in the site of Cerro de la Tortuga, there was 130 remains discovered dating, with certainty, to the Phoenician epoch. Recently, nine donkeys rests were found at the level of Celtiberiques de la Hoyo (in Basque country). The donkey had thus spread rapidly to all parts of the Iberic Peninsula.

It is possible that the donkey's appearance is even older if the discovery of its remains unfortunately unmeasurable, at the level of Iron Age I on Castillar de Mendavia (Navarre), were confirmed.

Between Andalousia and the Basque country, we can, whatsmore cite the donkey remains of Barchin del Hoyo (Cuenca) from the IV century before Christ.

Archaeozoology in Australia: the tendency to regionalization

David Horton

Archaeozoology in Australia has a number of unique qualities which have resulted from the combination of it's archaeology and it's fauna, both of which have a number of unusual features. Solutions which have been developed for the problems encountered may prove useful to archaeologists in other parts of the world and, conversely, work done elsewhere may prove useful in Australia if adapted to suit the particular conditions in this Continent.

The contents of the first regular number (Vol. 1: 1) will be:

1. Methods: **Wietske Prummel** Atlas for the identification of foetal skeletal elements of cattle, horse, sheep and pig. Part I.; **Jane C. Wheeler and Elisabeth J. Reitz** Allometric prediction of live weight in the Alpaca (Lama Pacos L.).; **Laszlo Bartosiewicz** Cattle metapodials revised: A brief review.; **Philippe Morel** The fragmentation of bone material: A definable mathematical process.; **Douglas V. Campana and Pam J. Crabtree** A language computer program for the analysis of faunal remains from the response of Archaeozoology.

2. Animal Species: **Manfred Teichert** Brachymel Dogs.; **Louis Chaix and Annie Grant** A study of prehistoric populations of sheep (Ovis aries L.) from Kerma (Sudan).

3. Man's role in assemblage formation: **Marylène Patou** Les marmottes, animaux intrusifs ou gibier des préhistoriques du Paléolithique.

4. Environment: **Iain Davidson** Size, climate and exploitation: size changes in the Eastern Spanish late Pleistocene fauna.

5. Strategies: **Alice M. Choyke** The exploitation of red deer in the Hungarian Bronze Age.; **Ina Plug** Iron Age subsistence strategies in the Kruger National Park (KNP), South Africa.; **Elisabeth Wing** Integration of floral and faunal data from Hontoon Island, Florida.

6. Seasonality: **Richard W. Yerkes** Seasonal patterns in the late prehistoric fishing practices in the North American Midwest.

7. Domestication: **Elisabeth A. Voigt** The dispersion of domestic stock into Southern Africa. **Sandor Bokonyi** Domestication and variation.

8. Traces and butchery techniques: **Sandra L. Olsen** Magdalenian reindeer exploitation at the grotte des Eyzies, Southwest France.

9. Social life: **Gillian Clark** Faunal remains and economic complexity.

To subscribe, or for further information, please contact:

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Davis, S. J. M. (1987). The Archaeology of Animals. Batsford, London. ISBN 0 7134 4572 6. 224pp. £14.95 in limp cover.

This book is intended for students and for the intelligent layman. It does not set out to satisfy the specialist archaeozoologist or to be an exhaustive survey of the field. Invertebrate animals receive little attention beyond the use of marine molluscs as indicators of seasonal occupation, and I dare say that mollusc and insect specialists will consider themselves to have been hard done by once again. All that being said, however, Simon Davis has set out to produce a wide-ranging introduction to a rapidly developing field in which bones, like it or not, have been the major raw material. The result is a textbook which is pleasantly readable, copiously and attractively illustrated - a book which will provide a much-needed up-dating of some of the faithful old retainers of the undergraduate reading list.

The book starts with an interesting and helpful survey of 19th century examples of zooarchaeology, placing these early records of fossil bones in the context of the slow, grudging acceptance of evolution and of the antiquity of the world. The first major section of the book describes and discusses practical matters such as taphonomy and taxonomy, as well as providing a good introduction to bone biology. It is refreshing to find a text intended for archaeologists which treats bone as a living tissue, not as the dead, immutable analogue of stone or ceramic. Perhaps some description of shell structure and chemistry would not have gone amiss, however, if only to supplement the account of incremental growth in bivalves. The numerous methodological problems associated with bone studies are presented briefly and clearly, rather in the manner of a well-structured lecture. There is no trace of either gloom or panic, the two syndromes which so often overwhelm discussions of archaeological bone methodology. At times Davis is refreshingly candid, for example:

'Perhaps the most serious shortcoming is that investigators vary in their ability to identify bones correctly.' (p. 23).

We do, don't we, but how many would cheerfully admit as much in print? One interesting methodological suggestion is the use of a restricted list of identified elements, i.e. not recording every identifiable scrap, but only those derived from particular parts of the skeleton. Such a procedure may be common in Near Eastern archaeology; it could certainly be more widely applied in Britain.

The second part of Davis' book is a survey of man-animal relationships (to borrow Don Brothwell's ringing phrase) from the early Pleistocene to the post-medieval period. Here the coverage is necessarily superficial, skimming through the millenia somewhat apace. There are numerous case studies, however, selected from all the major continents. Some topics receive more detailed consideration than others. The extinction of the Pleistocene megafaunas is discussed at length, with presentation of the arguments for and against the 'overkill' hypothesis. Davis offers his own opinion, making it very clear where the data end, and his opinion begins. The origins of animal domestication are also given a thorough working-over, the older theories of Childe and even Malthus being given due consideration alongside more recent literature. Inevitably such broad-brush treatment leaves gaps and permits only brief discussion, if any, of complex arguments. A reader new to the subject might be bewildered by the statement on p. 150 that 'In a hunting economy, man was likely to exploit the animal carcass to the full..' having been told on p. 113

that North American bison kill sites represent '...mass killings and substantial waste..'. However, given the degree of selectivity which must have been necessary in the preparation of this book, the text is remarkably free of non-sequiturs and over-simplification.

Overall, I thoroughly enjoyed The Archaeology of Animals. At a technical level, the precise use of terminology is satisfying, especially the consistent use of 'caprines' as the correct alternative to the horrid 'caprovids' which infests so much of the literature. The case studies are informative and appropriate, with plentiful illustration. Davis' habit of drawing vignettes of the appropriate species to illustrate graphs and histograms adds to the book's attraction. The reproduction of photographs is sometimes rather poor, though 'Beachcomber' devotees will enjoy the picture of Sebastian Payne apparently performing dentistry on an Angora goat (p. 40). Students will find this book to be a useful introduction to the subject, with sufficient reference to the literature to allow a topic to be pursued in greater detail. Those with a general interest in archaeology or natural history will find plenty of material for enjoyable browsing, spiced with the occasional unexpected turn of phrase. On p. 122 Davis asks 'What of the giant dormouse?'. What indeed?

T. P. O'Connor

Russell, N. (1986). Like engend'ring like: heredity and animal breeding in early modern England. Cambridge University Press. ix + 280pp. £27.50.
ISBN 0 521 306574.

Nicholas Russell's book surveys the historical evidence for selective breeding of horses, cattle and sheep in England from Tudor times to the late 18th century. The author describes himself as a biology teacher 'struggling to make sense of history', and the book is a distillation of his Ph.D. thesis. There are two reasons for bringing this book to the attention of Circaea readers: first because a small proportion will have some academic interest in the subject matter and, second, because Russell's survey of Classical and Renaissance theories of reproduction and heredity makes fascinating reading for all who are interested in the history and development of scientific thought.

Viewing the past from a modern agricultural context, it is easy to fall into the trap of accepting that selective breeding has improvement of form, productivity, wool, or whatever as its target. Russell corrects this idea firmly, showing that the mental framework in which early breeding strategies were developed centred on the notion that the forms of living things were created perfect, and that man's efforts in breeding his livestock could only stave off inevitable degeneration. The parallel with modern theories of cosmic entropy is rather tempting! Having set the intellectual background, Russell goes on to show how the concept of pedigree analysis, which figured large in 17th and 18th century horse breeding, was justified by analogy with the inbred families of the nobility, presumably turning a blind eye to the gentry's habit of illegitimate outbreeding. The idea that the adult qualities of a filly, calf or daughter could be predicted by examining the characteristics of family antecedents persisted into the famous breeding experiments of Robert Bakewell. Russell is hard on Bakewell, but probably not unfairly. His analysis of the actual benefits of Bakewell's 'improvement' of Longhorn cattle and Dishley Leicester sheep shows clearly that in terms of food conversion and dressing-out ratio, Bakewell achieved little.

Like engend'ring like contains a lot of information, including useful tables which compile fleece and sheep deadweight records by region through the 15th to 17th centuries. The text is peppered with references, all of them, regrettably, filed in a footnote system. Apparently, the publishers disapprove of the Harvard system. Despite this failing, the bibliography is copious, and Russell's thorough scouring of primary sources will render the book a useful resource for non-historians.

Now for the gripes. For around 10p per page, this reviewer expects some evenness of print quality, perhaps even good reproduction of photography. Clearly the publishers have to make a profit in a short print-run, but the price of this book is far too high for the reader to overlook smeared and murky photographs, thin paper, and a print quality which varies from evanescent to splodgy. The printer and publishers have done the author no credit, and have let down a useful and interesting book.

T. P. O'Connor

AEA one-day meeting at The University of Birmingham, March 1987

Summaries of papers, supplied by authors

The following is an extended summary of Richard Macphail's paper presented at Birmingham.

The soil micromorphology of tree subsoil hollows

Introduction

Most excavators and environmentalists are familiar with subsoil hollows on their sites, and frequently these are ascribed to the earlier presence of trees, on the basis of their field morphology (Limbrey 1975) and the land snails which they may contain (Evans 1972).

Such hollows are of interest to soil scientists because, on shallow soil sites on limestones particularly, they represent the deepest soil profile available for study. For example, at Hazleton long cairn, Gloucestershire, on oolitic limestone, the Neolithic palaeosol averaged some 13 cm in thickness, whereas subsoil hollows provided soil up to 46 cm in depth (Macphail 1986a). Similarly, these subsoil hollows may provide the deepest soil sequence for snail or soil pollen investigations if conditions are suitable for their survival.

Soil micromorphology has now been applied to a number of subsoil hollow features, and although complementary physical, chemical and geophysical analyses have been carried out (Macphail 1985; Allen and Macphail in press), this paper will concentrate upon the results of the microfabric studies. The latter may also suggest why data from standard laboratory analyses of bulk samples can sometimes be difficult to interpret.

Forest soils and development of subsoil hollows

Soils formed under broadleaved forest are typically Argillic Brown Earths (Avery 1980), known elsewhere as Udalfs, Luvisols or Sols Lessivés (Duchaufour 1982). When formed on thin drift or residual weathering debris of limestone, the generalised profile, from the surface down, has: a Moder (L,F) organic surface layer; a dark brown humic, biologically worked, finely structured A1 or Ah horizon; a yellowish-brown Eb or A2 horizon which my be moderately depleted of clay and iron; a brown, moderately clay-enriched Bt horizon showing clay coatings; and a reddish-brown ferruginous Beta B horizon at the weathering junction between the soil and underlying limestone (or chalk) or parent material C horizon. Initially trees tend to take root and grow in the deeper patches of the drift mantle where it overlies the irregular surface of the limestone. Enlarged tree hollows are gradually formed by the concentration of water containing reactive organic leachates which concentrate at the base of the tree and its root bole, and enhance the activity of the roots probing into the limestone.

Modern examples of the wind-throw of trees show that a hollow is formed in the soil, and that pale weathered subsoil/parent material clings to the root plate, remaining until frost and rain loosen it, or the tree decays. The hollow in the direction of the 'throw' contains disrupted brown soil, whereas the edges of the hollow as a whole slowly infill with topsoil. A discrete pattern of weathered parent material and soil is thus produced which, seen in plan, has a banana or horse-shoe shape, with brown soil infilling one side of the hollow and describing the outside circle of the feature. Brown soil also intercalates, at depth, with the wedge of pale disrupted subsoil/parent material fallen from the root plate (Lutz and Griswold 1939; Courty et al. in prep.). The slow infilling of a hollow can of course be disturbed by fauna burrowing through accumulations of soil and leaf litter. In thin sections of infilled tree hollows this faunal activity can be seen to produce a homogenised and very porous fabric as at Balksbury Camp, Hampshire (Macphail 1985). By contrast, at Hazleton long cairn and Ashcoombe Bottom, Sussex, the infills remained very heterogeneous, and fragments of the Beta B clay, the Bt and the Eb horizons were readily distinguishable (Macphail 1986b; Macphail in Allen in prep.). Soil micromorphology can thus demonstrate the physical mixing of the original horizons of the forest profile, the surviving ped fragments of which may provide the only available indications of the nature of the original forest soil cover. Obviously, bulk analyses of such heterogeneous soil material found in tree hollows will only give average measurements of clay or organic matter content.

In addition to the physical mixing of previously horizontal soil horizons, soil from the broken edges of soil fragments is readily slaked and washed down into the coarse soil fissures after rainfall. This mobilised soil is often relatively unsorted and forms coatings and infills (Bullock et al. 1985) of coarse clay, silt and fine sand.

To summarise, the post tree-throw fabric may show:

a) juxtaposed fragments of various soil horizons;
b) fragments of Bt horizons which often have clay coatings in their porosity which are not orientated to the present-day vertical and therefore relate to their forest soil ancestry; and
c) infills of poorly sorted soil in between the soil fragments.

Application

Many forest soils, especially the deeper ones, do not have obvious tree hollows, but have fabrics similar to those just described within their subsoils. For instance, a soil formed on impure (silty) limestone in the Italian Appenines, known to have been deforested in the 1940s, had such a microfabric, which can be clearly related to this phase of deforestation (Macphail in press; Courty et al. in prep.). Using examples like this and the previously described tree-throw microfabrics as a model, it should therefore be possible to look at archaeological palaeosols to see if there is similar evidence of tree disturbance that can be directly linked to human activity. For example, at Ashcoombe Bottom the presence of flint artefacts within the heterogeneous subsoil hollow may link this disturbance microfabric with Beaker Age forest clearance (Macphail in Allen in prep.). Other sites, such as the Bronze Age cairn at Chysauster (Macphail 1987) and the Neolithic rampart at Carn Brae (Macphail in prep.) in Cornwall, have similar fabrics relating to soil disruption and infills. These are quite close to the surface (20-40 cm), sometimes associated with wood charcoal, and apparently just pre-date sharply contrasting soil microfabrics associated with cultivation which occur at the soil surface. From previous studies (Romans and Robertson 1983; Macphail et al. in press) it has become evident that cultivation can produce its own specific microfabric, and at Chysauster and Carn Brae this is in the form of a homogeneous fine fabric containing phytoliths and 'Gramineae'-type (grass-derived) charcoal, within which are rounded voids (vughs) coated by very dusty clay. In these instances, the microfabric may be interpreted as suggesting that forest clearance was succeeded by cultivation, rapid archaeological burial preserving this sequence before any biological reworking could take place.

Conclusions

The study of subsoil hollows provides useful information on the early soil history, even if the original horizons only occur as fragments. Microfabrics resulting from tree-throw are not confined to subsoil hollows but may be present in all soils on which trees grew. Sometimes these fabrics, which have been equated with deforestation in modern soils, have been found in archaeological soils where supporting evidence may suggest forest clearance. Occasionally microfabrics indicative of cultivation may be superimposed on those of forest clearance.

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The Newcastle Quayside Project:

Environmental Archaeology in a Rescue Context

The Newcastle Quayside Project was set up by the Archaeological Unit for North East England to study the changing face of the river-front of the Tyne below Newcastle. Two major sites were excavated behind the present-day quayside, the first in 1984-5 and the second in 1985-6.

From the start a strict time limit had been imposed both on the excavation and on the post-excavation work, which meant that as much as possible of the environmental work had to take place during the period of excavation. The paper presented at Birmingham first discussed the advantages and problems of on-site sieving and sorting, but concluded that the advantages of getting the raw sediment processed and the residues sorted during the excavation, with the help of labour from a Manpower Services Commission Job Creation Scheme, far outweighed the disadvantages.

The results of the environmental work from the first site, Queen Street, were then summarised in terms first of the environment of the riverside prior to the extensive land-reclamation which took place from the early-mid 13th century, and second of the composition of the dumped material. This comprised both deposits which remained waterlogged and which formed a stable surface for building on, and non-waterlogged material which accumulated in the streets above, from the early 14th century onwards. The evidence suggests that the site was originally on the exposed foreshore of the Tyne, and subject to flooding. Analysis of the sediments and diatoms suggests that the site was possibly situated near the mouth of a freshwater tributary. Dumping seems to have taken place rapidly and to have involved domestic rather than industrial rubbish, with plant remains representing the sort of weeds likely to have been growing on disturbed and waste ground nearby, with a small component of food plants, including grape and fig, some possible cornfield and hay meadow weeds and possibly a few garden plants. The seed component was diluted by mineral matter, possibly from redeposited soil of floor sweepings, and abundant wood chips. No plant taxon was dominant in any of the samples. A wide variety of fish was represented, though gadids and herring predominated. Sand eel and small herring bones may have been present in the guts of other fish, but the evidence is inconclusive with regard to whether the remains originated in the documented fish-markets nearby. The problems of taphonomic processes were discussed in the context of both the mammal and fish bones.

The results of this work will be published in a monograph volume of Archaeologia Aeliana in 1988.

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Snails by numbers

How do you interpret large amounts of bio-archaeological material - in this case snails? We used the following methods:

1. Plotting the distribution of species through the samples;
2. Looking at each assemblage as a whole using diversity and multivariate analysis.

Diversity

Rank order curves (Evans, J. G. pers. comm; Kenward 1978) were plotted to show species:number ratio of individuals relationship. These proved to be useful in extreme cases. Underlying distributions have been sought to define this relationship: we used the logarithmic series, described by alpha, the index of diversity (Fisher, Corbet and Williams 1943; Kenward 1978; Southwood 1966; Taylor *et al.* 1976). To avoid assumptions based on an underlying model, non-parametric indices were used: Shannon-Wiener, Brillouin, Berger-Parker and Simpson-Yule (Southwood 1966). All showed similar trends.

Multivariate Analysis

We used Genstat (Alvey *et al.* 1977) to carry out the various steps of the Principal Components Analysis. From the arrangement of the variables along the principal component axes, we can identify which species of snail were associated with which others then see how these associations behave, and how constant they are, by relating the principal component information back to the original data.

We used Clustan (Wishart 1972) to identify and quantify the similarity between the different samples with a variety of different clustering techniques.

The results have been very promising, but we know this is only the beginning. We now realise that other approaches may be equally appropriate. We would welcome feedback and advice.

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The Spice of Life?

For some time, now, Philippa Tomlinson, Barrie McKenna and I have been recording assemblages of plant macrofossils from urban archaeological deposits, primarily in York and Beverley, that have yielded a range of seeds or fruits that seem likely to have been used whole (or in the case of the larger ones, also crushed or milled) as food flavourings. The list currently comprises opium poppy (Papaver somniferum), linseed (Linum usitatissimum), coriander (Coriandrum sativum), celery-seed (Apium graveolens), dill (Anethum graveolens), fennel (Foeniculum vulgare), and summer savory (Satureja hortensis - though I wonder whether the 'seeds' of this plant were actually used, or whether it has simply arrived in the deposits from dried plants being stored or used as a leaf herb). They are often found together with large concentrations of the 'bran' (in this case, the spermoderm layer) of wheat/rye (cf. Camilla Dickson's paper in the last issue of Circaea), and it is tempting to conclude that some, at least, were used to flavour and/or decorate some kind of bread or biscuit. It is, of course, impossible to distinguish the precise way such plant foods were used from the fossil remains - the contents of cess pits which provide most of this information obviously represent many different meals.

Readers may be interested in these few thoughts on the matter of the changing use of food flavourings in contemporary Britain, offered as a personal view and in the hope that they do not simply emphasise the naïvety of the author; your own views and anecdotal information would be gratefully received!

To someone like myself, raised in the 50s and 60s almost exclusively on white sliced loaves (through a period when, ironically, most commercially-made 'brown' bread was, to say the least, unappetising), the idea of strewing seeds on or, more adventurously, putting seeds in a loaf, was distinctly unusual. Although my experience may not be typical, I have a feeling that the use of such spices largely disappeared from commercial (and probably also domestic) bread-making in Britain until the revival, in recent years of the 'real loaf' (as well as greater access to 'exotic' foods through easier foreign travel and assimilation of many ethnic groups from all over the world). Much the same might be said regarding the use of spices (and herbs, for that matter) in other foods - apart from a few that continued to be used during what we might see as very dull period in British 'cuisine' (if it can be graced with the term): nutmeg, ginger (dry, ground powder only, of course), cloves and cinnamon (all used mainly in sweet dishes), pepper (though there has gradually been a return to the use of fresh-ground black pepper rather than the acrid, ready-milled white form), mustard (now available in a bewildering range of types, including whole-grain, not simply a yellow powder to be made into a condiment as required) and 'pickling spice', containing exotic items such as coriander and chillies.

Probably the most familiar of these spices to British readers, at least, in the context of bakery products is poppy seed (Papaver somniferum), typically used as a decoration. Elizabeth David, long a doyenne of British cookery writers, in her Spices, Salt and Aromatics in the English Kitchen (Penguin: 1970) asserts that poppy seeds (p. 45) 'are the seeds of papaver rhoeas' (sic), perhaps as a way of reassuring us that they (ibid.) 'do not contain opium'. I grew some pale blue-grey coloured poppy seed, bought from a wholefood shop in York this year; the resulting plants were clearly different from those of P. somniferum that had appeared 'spontaneously' nearby. They keyed out to P. somniferum ssp. setigerum, the supposed wild progenitor of P. somniferum ssp. somniferum

The use of linseed (Linum usitatissimum) for human consumption was completely unknown to me until I visited Norway in 1980. An ordinary supermarket in Oslo was selling this amongst the more usual grains, nuts and beans, and I was told that it was largely used as a laxative. Since then I have encountered Linsenbrot, a heavy, moist kind of rye-grain bread containing linseeds (sold, in this instance, in the delicatessen of a department store in Leeds), as well as recipes in some of the more progressive books on bread-making. The latter also mention celery-seed, coriander, cumin (Cuminum cyminum), and caraway (Carum carvi), of which the last is probably the only one to be used in commercial baking, as a flavouring for the kind of rye-bread that is made from from wholemeal wheat flour with an admixture of rye flour (in contrast to the pumpernickel-style rye-breads). Sesame (Sesamum indicum) and sunflower (Helianthus annuus) seeds are also becoming more widespread within and upon breads.

The last spice I want to mention is Roman coriander (or fennel flower, or kalanji - Nigella sativa), in which I recently developed an interest after having been shown an 'unknown' fossil seed by a colleague, which I thought might be a Nigella sp. Soon after, I purchased some nigella seed in a wholefood shop in York, mainly as a voyage of discovery (they have an intriguing and elusive flavour), partly as a source of material for the reference collections of both our laboratory and that of the colleague with the putative Nigella seed. Only eight days after seeing the fossil specimen I happened to call in at a local 'Vienna bakery' in suburban York for a loaf and was astonished to see a ring of white bread in the window, decorated with sesame seeds and nigella. The shop assistant, not unreasonably, did not know what the latter were (she does now, poor woman!), but mentioned that the owner of the bakery had been to Turkey and brought back a recipe by which the bread in question had been made. Pleasingly serendipitous, I thought.

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Spice and famine food? The botanical analysis of two post-Reformation pits from Elgin, Scotland

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Summary

The botanical analysis of the contents of two post-Reformation pits from Elgin has revealed some interesting details about contemporary life in the town. One pit appears to have functioned as a latrine, the other as a repository for peat ash. The latrine pit contained a wide range of arable weed seeds and fruits together with large numbers of intestinal parasite eggs. Many of the seeds and fruits are present as small fragments and they may have been ground for use as famine food. The pit also contains wads of flax and other fibres which are interpreted as 'toilet paper'. Small squares of cloth which were recovered during the excavation may have served a similar purpose or may alternatively have been used as pessaries or sanitary towels. A large number of crushed and ground black mustard (Brassica nigra) seeds were recovered from one sample and they are taken to represent usage as a spice.

Introduction

In the late 1970s portions of the 'backlands', properties which run perpendicular to the High Street in Elgin (Grampian Region, formerly Morayshire, in the north-east of Scotland), were excavated under the direction of Bill Lindsay (Lindsay forthcoming). Much of what was found dated from the 13th and 14th centuries, although material of 12th and 15th century date was also present. At one site, 26-28 South College Street, two pits of a later date, provisionally 17th or 18th century, were encountered and it is the analysis of the contents of these which forms the basis of this account. The pits were clay-lined and were cut into freely-draining natural sand. They were provisionally designated by the excavator as latrine pits and the main aim of the botanical analysis was to confirm or refute this interpretation.

Methods

Three samples were analysed. Two (856 and 863) came from the primary fill of pit 17, the third, (614) was from material used to back-fill pit 18. The whole of samples 614 and 856 were used for analysis, their total volumes being 75 ml and 50 ml respectively. A 100 ml sub-sample was removed from sample 863. The samples were dry-sorted to remove any large or obviously fragile plant remains, soaked overnight in a 1% solution of sodium hydroxide (NaOH) and sieved through 1.25 mm and 0.30 mm sieves, before the organic

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remains were wet-sorted and identified using both low- and high-power microscopy (max. x100 and max. x1000). The results are presented in Table 1. The nomenclature follows Clapham et al. (1981) and Watson (1981) unless authorities are given in the text.

Results and interpretations

Pit 18 - one sample

Sample 614 was very organic and contained compacted bodies of highly-humified plant remains pervaded by 'sedge' (Cyperaceae) rootlets. The impression that these represent peat fragments is supported by the fact that the majority of the few plant remains present were from species of heathland habitats. There was also a substantial fine charcoal and ash component and the sample apparently represents a mixture of peat and peat ash. A single fragment of corncockle (Agrostemma githago) seed may indicate past use of the pit for depositing latrine material or crop waste but the fragment could just as easily have originated incidentally from agricultural or domestic activities nearby or from reworking of older deposits.

Table 1. Plant and animal macrofossil remains from Elgin SC77, divided according to their likely origin or use. Abbreviations: pdf- pod fragment; s - seed; f - fragment; fb - fibre; a - achene; fr - fruit; lvs - leaves; rts - roots; lbsp - leaf-base spindle; sh - shoot; fbo - fruiting body; * carbonised; + present; ab abundant.

		Pit 18	Pit 17	
Food and other useful plants	part(s)	614	856	863
Brassica sp. (mustards, kale, etc.)	pdf			+
B. nigra (black mustard)	v			ab
? charred bread	f		+	+
Linum sp. (flax)	fb		+	+
	s			+
Malus sp. (apple)	pip			+
Papaver cf. somniferum (?opium poppy)	s			+
Rubus idaeus/fruticosus (raspberry/blackberry)	pip			+
unidentified plant fibres	fb		ab	+
Weed Species (° denotes possible food plants)				
Agrostemma githago (corncockle)	s	+	ab	ab
Centaurea sp. (cornflower/knapweeds)	a			+
Chenopodium album (fat hen)°	s		+	+
Polygonum sp. (persicarias/knotgrasses)°	fr			+
Raphanus raphanistrum (wild radish)°	pdf			+
Spergula arvensis (corn spurrey)°	s		+	+
Stellaria media (chickweed)°	s			+
Thlaspi arvense (field penny-cress)	s		+	+
Torilis cf. japonica (?spreading hedge parsley)	fr			+

Pit 17 - two samples

Sample 856 was made up of fibrous plant material in a sandy-silt matrix. Fine fibres were felted and coarser ones were aligned in loose short bundles. Fine seed and fruit fragments abounded and it was obvious from the species present that the material was largely faecal in origin. This is despite the absence of cereal testa (bran) fragments which are reported in similar material from other Scottish sites (Dickson *et al* 1979; Fraser 1981; Fraser forthcoming; Fraser and Dickson 1982; Robinson in press). Cereal testa fragments are rather delicate and it is quite possible, given the sandy silty conditions which prevailed, that they were present but had been degraded as was the case at the medieval site in Mill Street, Perth (Robinson forthcoming). The more robust remains, the fragments of seeds and fruits of contaminant weeds which are so characteristic of fossil faeces, tend to survive. In this case the species present included corncockle (*Agrostemma githago*), a serious cornfield weed in earlier times, being difficult to separate from the cereal crop and notorious for its content of toxic saponins (Wilson 1975). Present in lesser quantities were flour-sized fragments of field penny-cress (*Thlaspi arvense*), corn spurrey (*Spergula arvensis*) and fat hen (*Chenopodium album*). These are common arable weeds and crop contaminants but they have also been used as

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Heathland and wetland species				
Calluna vulgaris (heather)	lvs	+*		+
Cyperaceae (sedges, etc.)	rts	+		
Ericaceae (heaths, etc.)	fls	+*		
Eriophorum vaginatum (bog cotton)	lbsp		+	+
Juncus sp. (rushes)	s		+	
Mosses				
Sphagnum sp.	lvs		+	
S. papillosum	lvs			+
Thuidium tamariscinum	lvs		+	
unidentified	sh	+*		
Animal remains				
bone	f			+
feather	f	ab	+	+
hair (deer)			+	
hair (unidentified)				ab
insect remains			+	+
Trichuris sp.	eggs		+	+
sheep's wool (with attached skin)				+
Miscellaneous				
Cenococcum geophilum (fungus)	fbo		+	
charcoal	f	ab	+	+
fungal spores			+	
peat		ab		
peat ash		ab		

supplements to the food supply in times of hardship (Drury 1984). That they were present indicates that flour had not been fine-sieved before use to provide 'white' flour; the absence of bran fragments is thus clearly not because only 'white' flour was consumed.

Small fragments of a charred vesicular material were moderately abundant in the sample. They were generally 2-3 mm in diameter and have been tentatively identified as charred fragments of bread. They bear a remarkable resemblance to charred reference material of dense 'sourdough' bread. Eggs of the intestinal parasite whipworm (Trichuris sp.) were abundant in the sample and in many cases were seen adhering to seed fragments. Their presence suggests at least a mild level of infection and further confirms the presence of faecal material. No attempt was made to measure the eggs or identify the species of Trichuris. In the view of the other evidence it seems likely that they are from Trichuris trichiura, the human whipworm. The few animal hairs present, provisionally identified as being from deer (H. M. Appleyard, pers. comm.), are also likely to have had their source in faeces, or perhaps kitchen refuse. Plant fibres on the other hand were much more abundant and many have been identified as being of flax (Linum sp.). These fibres are characterised by having obvious nodes or 'knees'. Not all the fibres possessed this character, however, and it appears that a mixture of fibres is present. They could represent the residue from use of the pit for retting of fibre plants or possibly textile waste dumped directly in the pit. However the most probable explanation is that the material represents 'toilet paper' as large wads of moss, the material normally present in deposits interepeted as 'cess', were absent. It is not clear whether the fibre waste was a preferred commodity or just a substitute for moss.

Sample 863 was mostly from a compacted organic sandy silt with some looser sandy material. It, too, obviously represented faecal material although it lacked the large quantity of plant fibres found in the previous sample. Cereal bran fragments were again absent, but food plant residues, possible charred bread fragments and weed seed fragments were abundant.

A very high proportion of the sieved residue was found to be made up of seeds of black mustard (Brassica nigra). These were either whole, crushed or coarsely ground. The seeds are characterised by having on their surface a coarse 'ropey' reticulum with lumina 50-100 um in diameter. This reticulum is much more prominent than that found in any other Brassica species. In addition the palisade cells beneath the reticulum are also distinctive, having lumina which are either elongate (c. 8 x 3 um) or roughly circular (c. 5 um in diameter) (Winton 1916). The seeds were difficult to measure because most were crushed or misshapen; however, the majority appeared to be well in excess of 1 mm in diameter. Seed pod fragments were also recovered from this sample. They closely resemble reference material of various Brassica species and it was not possible to identify them positively as coming from B. nigra. This plant has an extremely long history of usage as a spice, being the source of mustard mentioned by Pythagoras and being employed in medicine by Hippocrates in 480 BC. It was described as a garden plant by Albertus Magnus in the 13th century and has had numerous mentions in Herbals (Hedrick 1972). The young plants were eaten like spinach or used in salads and the seeds were a major source of mustard the world over until they were replaced by those of white mustard (Sinapis alba) about two decades ago (Hemingway 1976). In the light of this it seems more likely that the seeds were used as a spice rather than a famine food. Mustard flour made from wild radish or charlock (Raphanus raphanistrum) was more commonly used in this latter respect (Drury 1984), although it also found use as a spice, the so-called 'Durham mustard'.

Other food plants present in this sample included apple (Malus sp.) pip fragments, a raspberry/blackberry (Rubus idaeus/fruticosus) pip and possibly opium poppy (Papaver cf. somniferum) seeds. The latter were and are used as a spice and as decoration on bread and pastries. Weed seeds and fruits, some intact, some in fragments, were more numerous and from a wider range of species than in the previous sample. Some, such as corncockle (Agrostemma githago), cornflower/knapweeds (Centaurea spp.), wild radish or charlock (Raphanus raphanistrum) and possibly spreading hedge parsley (Torilis cf. japonica) are likely to have been unavoidable crop contaminants. Others, like the persicarias/knotgrasses (Polygonum spp.), chickweed (Stellaria media), corn spurrey (Spergula arvensis, fat hen (Chenopodium album) and field penny-cress (Thlaspi arvense) may have been intentionally retained or even added to the food crop (Drury 1984). The flax seed fragment which was recovered may also have been part of the diet or may have had a medicinal use. Whipworm (Trichuris) eggs were again present as were animal fibres, which in this case had skin attached and were provisionally identified as being wool (H. M. Appleyard, pers. comm.). Cereal pollen grains were found adhering to the seed fragments in association with the whipworm eggs.

Conclusions

The analysis of the fill of pit 18 (sample 614) provides little information other than that the pit was back-filled with a mixture of peat and peat ash which presumably originated from a nearby hearth.

The conclusions from the analysis of the contents of pit 17 are much more interesting and, with respect to the social status of the contributors to the latrine material, are also rather conflicting. On the one hand the presence of black mustard and ?opium poppy seeds and the possible evidence for consumption of venison and mutton suggest a lifestyle above that of the average commoner (Donaldson 1794, cited in Fraser forthcoming), whilst on the other hand the abundance of fragments of so-called famine food species suggests the contrary. It may be that these fragments just represent the normal level of contamination in flour available at that time or that the latrine material was from persons of mixed social status. The presence of the whipworm eggs is of little value in resolving this question as these worms probably afflicted rich and poor alike.

The wads of flax and other plant fibres from this pit are interpreted as having been used as 'toilet paper' and small squares of cloth recovered from the pits during the excavation may well have served a similar purpose. It has been alternatively suggested (C. A. Dickson pers. comm.) that the cloth squares could have been used as pessaries as described by Dioscorides in A.D. 65 (Gunther 1933) and as widely used since that time. There are no plant remains present which may have used in connection with the pessary but this is hardly surprising as an extract of the plant rather than the plant itself is likely to have been used. A further possibility is that they represent tampons or sanitary towels, as has been suggested from medieval Bergen by Krzywinski et al. (1983). Although obviously organic in content, samples 856 and 863 are remarkable for their high sand and silt content. This could have had its origins in the sand into which the pits are cut. It is also possible that deliberate covering of the faecal material with sand took place. This would reduce the odour from the material and promote its breakdown by micro-organisms. This practice was the basis on which earth closets, which were used in country areas until relatively recently, functioned efficiently.

Acknowledgements

I would like to thank Bill Lindsay (Falkirk), H. M. Appleyard (Halifax) and Camilla Dickson (Glasgow) for their helpful comments and suggestions regarding this work. The research took place at Glasgow University in 1985 and was funded by the Scottish Development Department (Historic Buildings and Monuments), Edinburgh. The excavation at 26-28 South College Street took place in 1977 under the auspices of the Elgin Archaeological Heritage Trust with monies provided by the Manpower Services Commission and the Scottish Development Department, Ancient Monuments Division.

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The role of the 'junior' in environmental archaeology: a personal view

Rebecca Nicholson *

Summary

From the author's standpoint as someone employed within archaeology to co-ordinate on-site 'environmental' work and undertake specialist investigations of one class of biological remains, the advantages and disadvantages of such a position are discussed.

'The very great need for scientists coming into archaeology to work under the guidance of experienced people, and to have access to good facilities and reference materials from the beginning is best satisfied by the establishment of junior posts in association with existing centres. This is much to be preferred to the establishment of isolated junior scientific posts associated with archaeological organizations where there is no opportunity for training and supervision. However admirable may be the efforts of people in such positions to train themselves and to build up their laboratory facilities and reference collections, it is wasteful of resources, and carries a high risk that results will be published before adequate standards have been reached.' (Thomas 1983, 50)

The aim of this short discussion is to present a personal view of the situation regarding the employment of the junior 'environmentalist' in archaeology, to assess the advantages and disadvantages of setting up posts within the existing archaeological units, and to suggest how the needs of the specialist can be met within an archaeological framework. The term 'junior' is used here to refer to archaeologists and scientists who have undergone a basic training in environmental archaeology, but have not had extensive practical experience.

To explain the personal bias in the paper, at the time of writing I am employed as a Junior Researcher in the Archaeological Unit for North-East England, to act as both the 'on-site' environmentalist and a specialist in one of the aspects of the biological remains recovered from our excavations (fish bones). The post is therefore at least in part of the type that the Archaeological Science Committee of the CBA (Thomas 1983, above) dismissed, so I felt that there was a need to put forward a personal view of the value of the 'in-Unit' environmentalist.

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To turn firstly to the advantages of the position: the linking in a single post of the on-site environmentalist with the worker on one of the specialist areas has one obvious advantage, which is that the specialist in at least one area of study has seen the excavations and been involved in them to a much greater degree than any laboratory-based specialist could be. This can enable sampling on-site to be geared much more closely to answer particular research questions formulated by the specialist, some of which may only be generated as a result of seeing the excavation in progress and may therefore be of a much more interdisciplinary nature than is often the case when 'off-site' specialists formulate questions in isolation from the excavation. By working closely with the post-excavation team the on-site/in-Unit environmentalist can also speed up the progress of specialist report writing by being on-hand to answer queries and sending the relevant documentation to the other environmental specialists involved in the project. Crucially, too, the environmentalist can assess the results of the specialist reports as they arrive and take a wider view of the conclusions, enabling a synthesis of the results of the environmental analyses to be presented.

The appointment of an on-site environmentalist should also lead to a greater amount of the 'technical' work associated with sampling and processing samples being undertaken on-site, by the excavation team under supervision, resulting in time-saving within the laboratory as much 'ready-processed' material can be sent. By allowing the on-site environmentalist an important role in the post-excavation programme, it is also possible to attract better qualified applicants than would have applied for a purely excavational post.

So much for the advantages of the creation of junior posts within archaeological establishments. Now for the problems. The major disadvantage, as Thomas has pointed out, is that a newly-qualified environmentalist (and long-trained environmentalists, for that matter) requires easy access to a comprehensive body of reference material, which few, if any, archaeological units can provide. The specialist also requires, to a greater or lesser degree depending on the specialism concerned, access to scientific equipment, much of which is beyond the pocket of archaeological establishments. While individual workers will, of necessity, build up their own reference collections, the time and money needed to build up a comprehensive collection would not be tolerated by most funding bodies, and not suprisingly so!

The concept of an individual environmentalist creating a laboratory is therefore an unrealistic aim, and the time and money would be much better spent in already established laboratories manned by a number of specialists. The other very valid point made by the Archaeological Science Committee (see quotation from Thomas (1983), above) is that junior researchers, in particular, need easy access to other workers in their field to enable constructive discourse and criticism to take place resulting (it is hoped) in improvements in standards of work. There is indeed a danger of publishing work before adequate standards of identification and interpretation skills have been reached, and this applies no less to the contract worker, established at home, than to the junior researcher in isolation within an archaeological establishment.

So what is the best way forward? If junior workers are restricted to working within established laboratories under careful supervision, who is going to take on co-ordinating the job of the on-site environmentalist? If on-site environmentalists are precluded from any of the post-excavation work, apart from the 'technician' tasks they will rapidly become disenchanted with the subject, and will find advancement difficult without a specialisation in their pockets. Yet on-site environmentalists must have a training in environmental archaeology in order to understand sampling requirements, and the needs of specialists. In my view the best way forward is to employ much greater flexibility within junior posts, to enable the environmental archaeologist to work both on-site, and at the post-excavation stage within an established laboratory to pursue a specialization, but with frequent visits back to the archaeological establishment to keep up to date on the progress of the archaeological interpretations. The obvious problem is, of course, the non-availability of established laboratories in some regions. While the ideal solution would be the creation of more established laboratories, in the present financial climate this seems a little unlikely! There are, however, Universities, Polytechnics and Colleges accessible from most areas of the U.K., where ties with scientific laboratories may be possible. Speaking as one based in a Unit within a University it is suprising how much help is available outside the Archaeology Department, once communications are established, but perhaps communication should be the first objective for, without a concerted effort on this front, it is suprising how little information passes between university departments, let alone between departments and bodies outside the academic establishment.

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The role of palaeoecology in understanding variations in regional survey data

A. J. Schofield *

Summary

This paper is presented, not by a trained palaeoecologist, but by someone involved with regional survey and the interpretation of variations in the density and form of lithic collections across the landscape. It is suggested that broad generalizations regarding early prehistoric land-use can be made from existing palaeoecological evidence - in this case defined as pollen and non-marine mollusca - in its published form, and used as a framework within which variations in artefact density may be more fully understood.

Introduction

Over the past decade, central-southern England has seen a renaissance of archaeological activity brought about, at least in part, by the switch from site-based research projects to a broader regional frame of enquiry. A considerable amount was known about prehistoric 'places' in the Wessex landscape, but our knowledge of the 'space' between those places was, to say the least, limited.

At around the same time, palaeoecology really came of age (see, for example, Evans 1975), and in the last decade our knowledge of how and to what extent early prehistoric communities were manipulating the Wessex landscape has increased dramatically. In particular, it has been demonstrated that events were taking place not only in different places and at different times, but often at varying scales of intensity. Work in coastal and estuarine environments (e.g. Haskins 1978), on areas of chalk downland (Waton 1982), on Tertiary sands and gravels (Seagrief 1960; Barber 1975) and in major river valleys (Allen 1986; Seagrief 1959; Scaife and Burrin 1983; 1985) has demonstrated the extent to which land-use intensity varied between distinct resource patches within the environment.

Unfortunately the potential for integrating this kind of information into regional field survey projects has not yet been fully realised (but see Schofield in press), possibly because such information is only useful if it reflects events within the precise study area under investigation. This may not necessarily be the case and it is argued here that such a relationship would in fact be of considerable benefit in understanding patterns of both settlement and land-use for the mesolithic, neolithic and Bronze Age periods. This paper defines the case for integration by means of a case study from the upper Meon valley, south-east Hampshire.

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Palaeoecology

With the exception of the analysis by Gordon and Shakesby (1973) of dry valley-fills at Butser Hill, no palaeoecological results were available from anywhere near the study area itself. Rather than treat that as a lost cause, however, it was decided to draw in results from other river valleys in the region by way of analogy, to see whether any generalizations could be made and a general model of changing land-use devised. It became clear that in the mesolithic few areas in this part of southern England were open, an exception being Winnall Moors in the Itchen valley near Winchester, where the grass pollen was equivalent to around 40% of the total arboreal pollen sum (Waton 1982). Another example is the Avebury region where Smith (1984, 107) noted the tendency for mesolithic finds associated with early woodland disturbance to be concentrated in the valley bottoms.

It is not until the early neolithic that distinct trends really begin to emerge. At Easton Lane (Allen 1986), Easton Down (Mason 1982) and other low lying sites in the Itchen valley, for example, clearance occurred at an early date, with cereal cultivation present on valley slopes. In the Ouse and Cuckmere valleys in Sussex, Scaife and Burrin (1983; 1985) suggest a similar theme with woodland being opened up at an early neolithic or even mesolithic date.

On the surrounding chalk uplands and gravel interfluves however, a very different picture is presented. In contrast to the large-scale clearance occurring in river valleys, temporary small-scale deforestation was more typical, appearing for example at Brook, Kent (Kerney et al. 1964, 165) and on the Sussex Downs (Thomas 1982). In each case this was followed by the regeneration of scrub and woodland. It was not until the early to middle Bronze Age that many of those areas still maintaining primary woodland were cleared on a permanent basis. This was the case, for example, on the Hog's Back, Surrey where 'wild wood' was removed on a local scale for the construction of a Bronze Age barrow (Allen 1984). A similar theme is reflected in the sequence from the Vale of Brooks, where temporary clearance in the neolithic was succeeded by a more substantial clearance episode in the middle Bronze Age (Thorley 1981), and at Itford Bottom, where an early Bronze Age date was produced for primary clearance (Bell 1983).

A similar picture is suggested by work in the area west of Poole Harbour. Seagrief (1959) quotes an early neolithic date for floodplain clearance at Wareham, while in the surrounding area Haskins (1978) records little evidence for the impact of man, again prior to the middle Bronze Age. The only exception to this is the site at Rimsmoor which produced cereal pollen grains dated to the late Atlantic phase; it may be no surprise that here, as at Wareham we are dealing with a valley bottom location.

Although the evidence for woodland disturbance is therefore fairly widespread both in time and space, it does appear to show a clear distinction between the scale and intensity of land-use in river valleys and that over the rest of the landscape (Table 2 and Fig. 1). There is clearly a case to be made for applying these general observations to the distribution and behaviour of prehistoric communities in southern England. In order to clarify the nature of this distinction in terms of the results described below, two types of population response may be identified:

(a) coarse-grained response: in which groups will spend disproportionate amounts of time in particular resource patches;

(b) fine-grained response: where a group encounters and uses resources in the same proportions in which they actually occur.

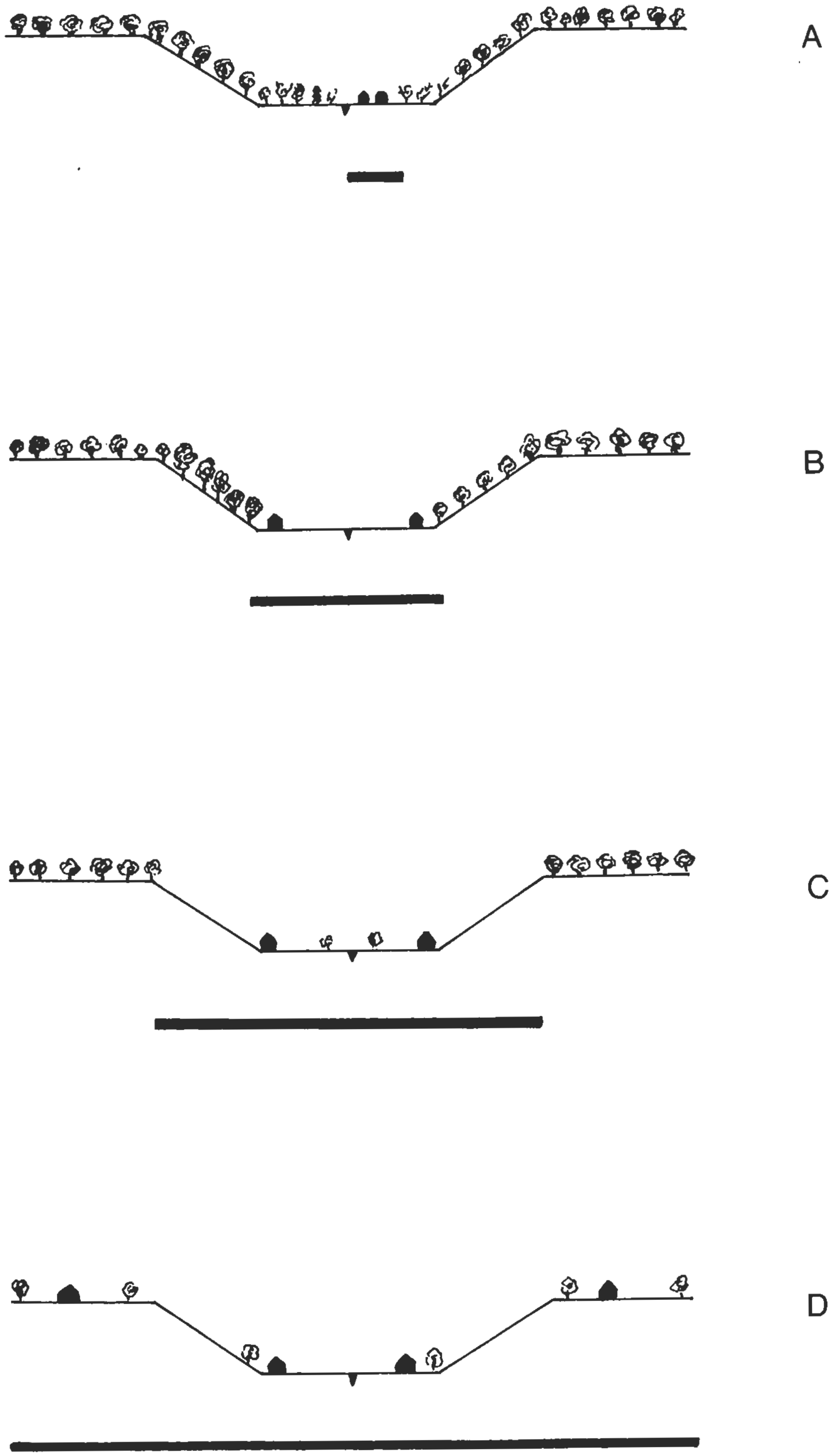
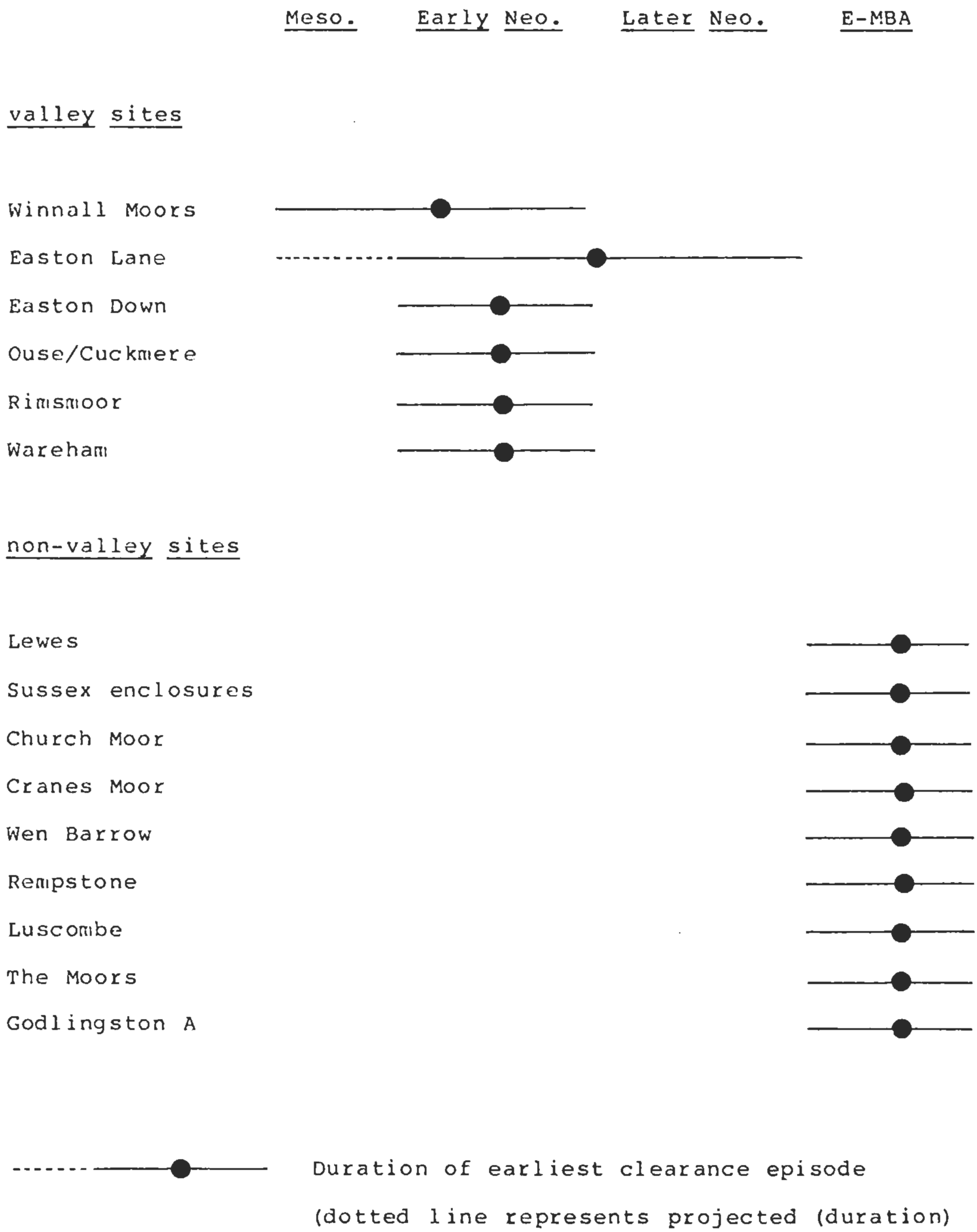


Figure 1. Schematic reconstruction of valley land-use strategies through time. The black bar beneath each section represents the spatial limit of home-range activity as represented by surface artefact collections. A: mesolithic - localised small-scale clearance episodes focussed on valley floor. B: early neolithic - intensive floodplain clearance and cereal cultivation. C: later neolithic - clearance of terraces; some woodland regeneration. D: early to middle Bronze Age - clearance on a large scale including for the first time areas of interfluve and chalk downland.

Table 2. Dates for the earliest major clearance phase in valley and non-valley contexts.



We may therefore expect to see a coarse-grained selective response in valley floor environments where the resource 'package' is both stable and particularly favourable to long-term settlement. It is here that we should expect to see intensity and continuity of land-use throughout the prehistoric period and displayed in the palaeoecological record in terms of long-term and large-scale clearance. A fine-grained response will occur in areas away from river valleys and will be characterised by a lack of continuity or intensity of prehistoric land-use and occupation.

Archaeology

The concentration of early prehistoric communities in river valleys indicated by palaeoecological evidence is an inference further maintained by the archaeological record. Although few known 'settlement sites' have been excavated in southern England, those that have tend to occur, with very few exceptions, in the narrow, compact ecological zones which run parallel to river valleys. For the mesolithic period this is most clearly illustrated by Froom's (1972) investigations in the Kennet valley and the relationship between that area and the Berkshire Downs (Richards 1978) from which few mesolithic finds were recovered. This is a pattern which continues into the neolithic and is illustrated in the case of northern France where settlements display a marked concentration on river valleys, with a particular emphasis on gravel spurs overlooking the valley floor (Howell 1983). This is also the case in southern England, although the evidence is far less substantial. At Pamphill, Dorset (Field et al. 1964), Corhampton, Hampshire (Piggott 1954, 383) and Downton, Wiltshire (Rahtz 1962), for example, settlements appear in analogous situations to those in the Aisne and Marne valleys of northern France. It is only in the Bronze Age that we begin to see settlements appearing with any frequency on the chalk uplands, although they still continue to occur in valley contexts.

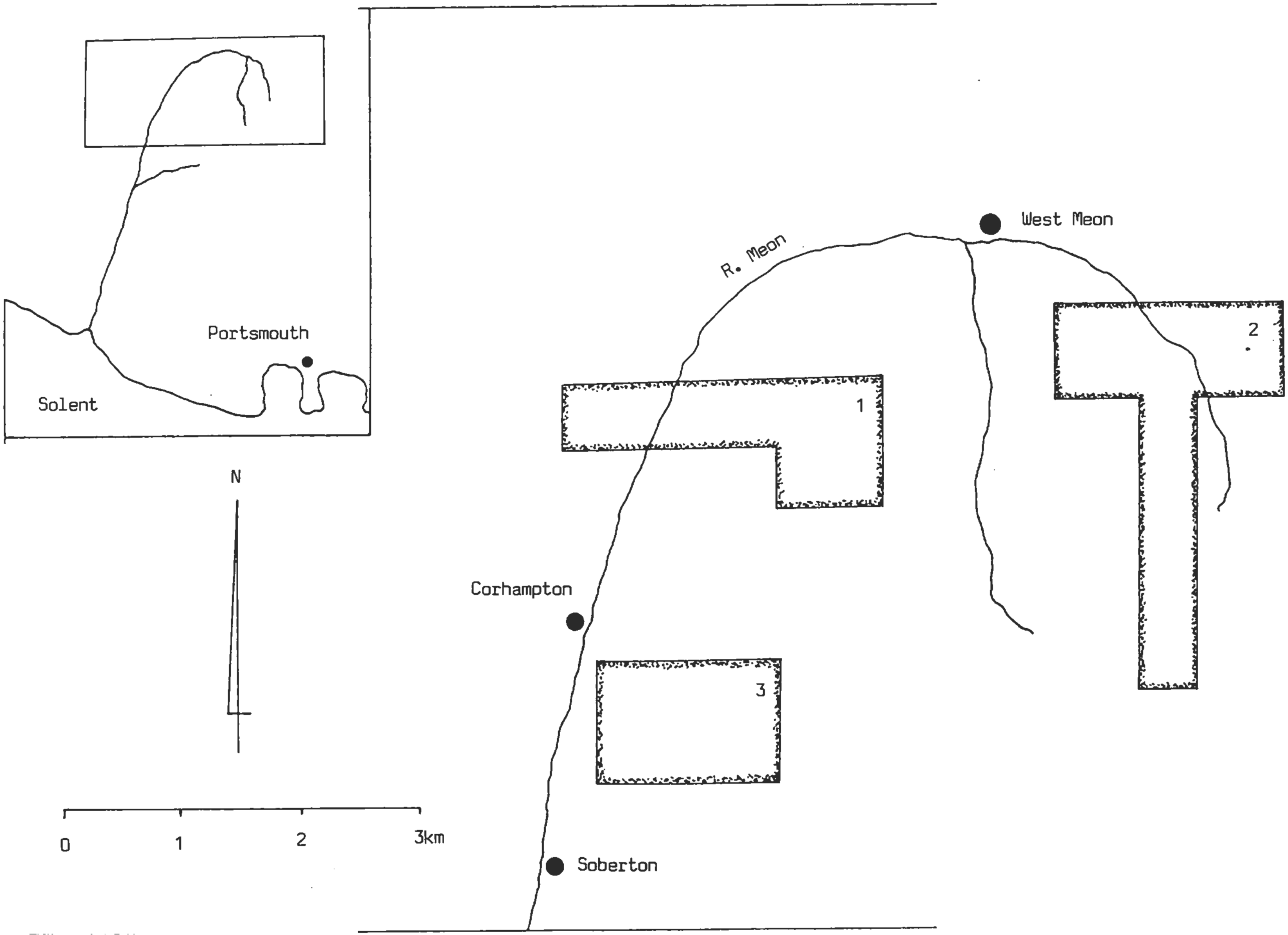
Smith's (1984) investigation of neolithic human ecology in the Avebury region further maintains this idea of a 'valley adaptation'. The distribution of both mesolithic and early, middle and late neolithic settlements in the area displays a clear tendency towards river valley locations. Few valley settlements in this area have significant breaks in their occupational history, while if sites such as Hemp Knoll are truly reflective of what was happening on the surrounding uplands, settlement here was distinctly intermittent.

We can conclude therefore that the evidence both from archaeological sources and from palaeoecological investigations in the south of England suggests that a coarse-grained response can be identified, with foragers and early farmers spending a disproportionate amount of time in valley environments, at least up until the end of the neolithic. We may now consider, by means of a case study of a regional surface survey, whether this relationship can be confirmed.

Case Study: the upper Meon valley survey

The river Meon is one of several chalk streams maintaining a constant year-round temperature which run from north to south across the Hampshire Basin, with low river terraces and pastures on the valley floor, valued today for their quality spring grazing. The survey of the upper reaches was carried out between 1984 and 1986 with the aim of locating areas of mesolithic and neolithic activity and trying to identify changes in land-use between those periods. Data collection was carried out by field walking based on a 15m line interval and concentrating on three blocks of land which each encapsulated an area of floodplain, terrace and interfluve and which were spaced at 2-3 km intervals (Fig. 2). Areas 1 and 2 were situated on an area of Lower Chalk while area 3 was located on an area of undifferentiated Upper Chalk downland.

Figure 2


Portsmouth
Solent
N
0
1
2
3km
R. Meon
West Meon
Corhampton
Soberton
1
2
3

From both the high density of artefacts in fields within the Meon valley in relation to those over 1 km distant (Table 3) and the disparity between density figures from valley contexts and those from areas which contain no major valley system (Table 4), it is clear how closely the evidence is associated with river valleys. It is also interesting to note the degree of consistency in the proportion of tertiary flakes which occur in fields within the Meon valley. Tertiary flakes were by far the most frequently retouched waste class and such a degree of consistency as is suggested by the low standard deviation given in Table 3 may well reflect a degree of functional autonomy within that context, namely for settlement as opposed to hunting or quarrying activities. It has been demonstrated both here and in the Avon valley survey (Schofield forthcoming) that these types of activity do produce very different patterns and combinations of artefacts, and that any degree of regularity must be looked at in terms of a coarse-grained adaptation.

Table 3. Density of worked flint in relation to valley/non-valley contexts within the Upper Meon survey area.

		valley (n = 25)	non-valley (n = 19)
flint per ha.	mean	36.3	11.7
	s.d.	29.5	13.3
% retouch	mean	7.0	6.9
	s.d.	5.1	4.5
% tertiary waste	mean	20.0	20.5
	s.d.	3.8	8.4

Most of the material described was either mesolithic or early neolithic in date; there was a high proportion of blades, while numerous microliths and blade cores were recovered on the valley floor and terraces. Both the density of artefacts and the high proportion of scrapers tend to support the idea that it was in these areas that settlements were concentrated. Both from existing finds and from the survey, a clear distribution of axes and arrowheads has emerged which appears mutually exclusive to that of settlement. The arrowheads and axes - suggesting extractive activity, such as hunting and felling timber - all occur on the Upper Chalk and away from the river, a trend which is mirrored elsewhere in southern England and which applies to all periods of prehistory (Gardiner and Shennan 1985; Bradley and Ellison 1975).

Figure 2 (opposite). Location of the survey area and the three sample units within it.

Table 4. Variable flint-density characteristics between survey areas in southern England.

	mean density per ha	s.d.	min.	max.	no. cases
East Hampshire	8.0	10.0	0.0	70.0	275
Avon valley	18.7	12.8	0.5	61.8	82
Meon valley (Lower Chalk)	12.4	12.5	0.0	66.0	31
Meon valley (Upper Chalk)	50.0	29.8	16.8	110.6	13

It is suggested therefore that the valleys contained settlements and were subject to the coarse-grained response described above, while the areas away from river valleys remained wooded through to the Bronze Age simply because their role as extended territories did not necessitate large-scale clearance. These areas were used throughout prehistory for hunting and foraging, as reflected in the distribution of microliths, leaf-shaped, transverse and barbed and tanged arrowheads, and the supply of timber, as reflected in the distribution of tranchet and polished stone axes.

Discussion

The case study demonstrates quite clearly the advantage of applying general models of settlement and land-use history to artefact distributions supplied by regional survey. In the past, our concern has been with locating 'places' where people lived at a particular time. Instead we should begin to focus on those aspects of behaviour which are repetitive and accumulative in nature, and leave the analysis of precise moments or events to those involved with excavation. Regional survey cannot answer those very specific types of question but can provide a very detailed general picture of land-use and settlement over a long period of time. This picture would be greatly enhanced if we were to spend a little more time studying the palaeoecological evidence and establishing hypotheses which could direct the focus of attention for areas and questions under investigation.

The relationship between palaeoecology and the interpretation of surface artefact collections is therefore crucial if we are to achieve a fully integrated picture of what prehistoric communities were doing in this area of southern England. It would enable us to produce not a random collection of black-and-white snapshots but a full portfolio, illustrating in 'glorious colour' the extent to which prehistoric communities were exploiting their environment.

Acknowledgements

I am grateful to the many people who assisted with surface collection and the landowners in the Meon valley who were so co-operative. Special thanks go to my research supervisors, Arthur ApSimon and Clive Gamble, whose encouragement and enthusiasm has been a great stimulus, and to Mike Allen for commenting on my attempts to use 'snails and pollen' as a means to understanding the distribution of 'flints'. All mistakes, however, are of my own making.

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A survey of the Association for Environmental Archaeology and its membership: 1980-86

Bruce Levitan *

Summary

Some aspects of the history and changing size and distribution of membership of the Association for Environmental Archaeology are presented and discussed.

Most of you will know me by name if not by sight. I am the person who pesters you each year to 'pay-up or be struck-off the membership list'. If you pay by standing order, you may have shared some of the annual headaches I get trying to rectify - at the expense of the AEA and my own time - the errors of the banks. If you pay by cash or postal order or cheque, you may occasionally find your name on a roll of members who have not paid up which appears in the January issue of the Newsletter. (I do this, rather than writing to you individually as it saves time and postage, and I hope it is not embarrassing if your name does appear).

I took over the job of Membership Secretary in 1984, and in the same year, Vanessa Straker took on the job of Treasurer. Bob Wilson became General Secretary in 1984, and this job has since passed on to Mark Robinson. Besides the major task of editing and publishing Circaea, the final job devolving to a member of the AEA committee is that of Publications Officer - this is presently being done by Rob Scaife. Prior to 1984, all these jobs, except the production of Circaea, were done solely by Nick Balaam, who was also instrumental in setting up the AEA back in 1979, along with Professor Geoffrey Dimbleby, Don Brothwell and Simon Hillson. (In fact, if my memory serves me correctly, some of the first discussions at which the idea of the AEA was made public took place at the CBA Urban Environmental Archaeology conference in York). Thus, we all owe a tremendous debt to Nick who built-up the organisation to the healthy state in which I found it (see Table 5). Even now he has not completely stepped aside from AEA duties, as he represents us on the Science Panel of the CBA. This paper, therefore, is dedicated to him.

Prior to 1983, the membership records were handled manually, but since then they have been computerised, so in starting this survey my first task was to try to fill in the 1979-82 'gap' on the computer. Luckily the full membership list which appeared in Newsletter 5 (November 1980) helped, but the records previous to this are limited, so I have not included 1979 in the survey.

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When I started work on this paper, I was simply interested to see for myself how our membership has grown. One of my more pleasant tasks has been to send out details to people wishing to join, and it seems that in each year there has been a fairly large enrolment of new members. Almost immediately, however, a number of other questions posed themselves, and the list of topics to consider grew to form those listed below, of which (1) - (5) cover the seven-year period, and (6) covers 1986 only. Two additional topics I could not fully answer, because the records are not complete enough, relate to the proportion of students, and the division of interests. (To some extent the latter can be gleaned from the Research Interests listings in Newsletter 13 and 14.)

1) Number of members in each year.
2) Numbers of resignations, new enrolments and reinstatements in each year.
3) Number of overseas members in each year.
4) Number of institutional members in each year.
5) Relationship of membership numbers to rises in subscription.
6) Distribution of members.

Numbers (1) - (5) are covered in Table 5 which shows the total membership in each year, and how this is made up in terms of new members and reinstated members. It also summarises the number of resignations in each year. The table gives numbers of overseas and institutional members, but only indicates their net increase or decrease, since these figures are not broken down for resignations, reinstatements or new enrolments. The table shows that after an initial small fall in numbers (most of which was due to resignations from overseas members) the membership has steadily increased, with 1983 the boom year, but increases in 1985 and 1986 being in the order of 30 members. The proportion of overseas members has also grown and they now form about 14% of the total.

Table 5. Summary of AEA membership 1980-1986

	1980	1981	1982	1983	1984	1985	1986
New	-	0	1	103	19	46	49
Resignation	-	5	0	2	4	19	23
Reinstatement	-	0	0	1	4	5	9
Institutional	0	0	0	1	4	5	9
Overseas	9	6	6	22	30	39	49
Honorary	2	2	2	2	2	2	2
Total	141	136	137	238	254	283	316

It is interesting, therefore, to note that subscription increases have not, apparently, had any adverse effect upon membership numbers. The first increase, from £2.00 to £4.00 actually occurred in 1983, the year of the greatest increase in membership, and the second increase, in 1986, does not seem to have affected the trend since then. This is illustrated by the graph (Fig. 3), which shows the increase in membership year by year, and gives pointers for the years in which the subscription was increased. The increases in subscriptions, of course, are equated with improvements in the service of the AEA, 1983 seeing the birth of Circaea and 1986 the rebirth of the Newsletter which had been suspended when Circaea first appeared. Part of the reason for the 1983 'boom' must be the appearance of Circaea. Many people who had not previously come across the AEA may have heard of the Association by reading Circaea, and others, who had heard of us but not joined, may have been attracted by the idea of receiving the journal.

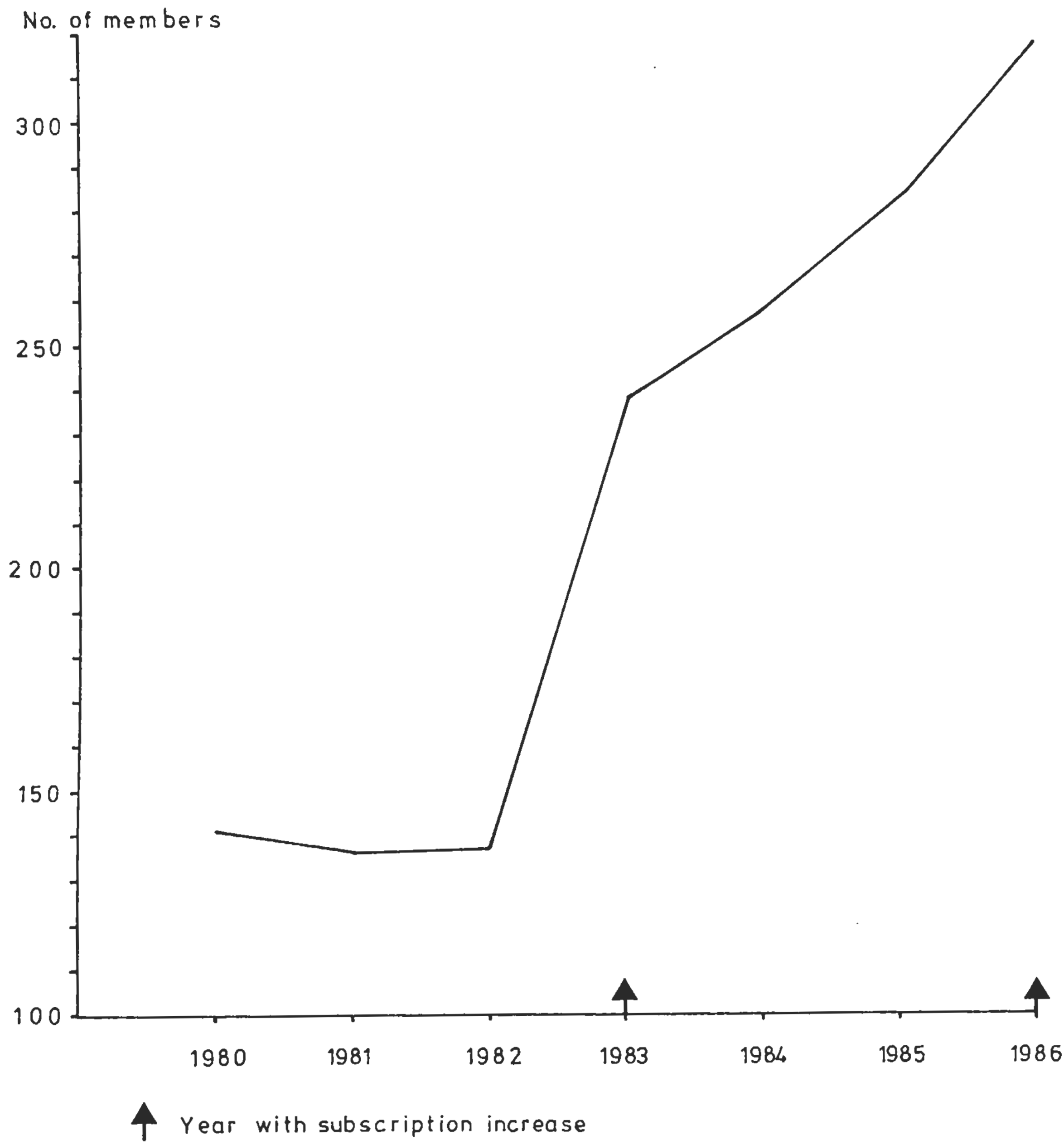

Figure 3. Graph showing AEA membership from 1980-86.

Returning to the table, the only note upon which any alarm may be sounded is the number of resignations in each year. These rose from two in 1983 to 23 in 1986, and although membership also increased, the proportion of resignations in each year has grown (from 0.8% in 1983 to 7.3% in 1986). One explanation may be that we pick up a flush of student members around conference time, and these stay in the AEA for only a year or two. On average, however, people tend to stay members for three years or longer, and over a third of our present membership comprises people who joined in 1981. At the moment new recruitments are outstripping losses, but this is no reason for complacency, and we should ask why the trend towards an increased percentage of resignations is occurring. One explanation may be that most of the losses are students who have graduated and left archaeology (and because the number of students enrolling has grown, so the number of student losses has also increased). The reinstatement figures show that most people do not change their minds after leaving the AEA. Most reinstatements occurred after a one year gap which may indicate simple absent-mindedness, but some were after three- or four-year gaps.

As may be expected of an organisation formed in and operating from Britain, the majority of members are British (86.4% in 1986). Most of these are from England, with only ten (3.2%) in Wales, nine (2.8%) in Northern Ireland and thirteen (4.1%) in Scotland. London is the clear winner in terms of concentrations, with 56 people in Greater London and six more close-by (total 19.6%), Other main concentrations are in Sheffield (19, 6.0%). Cambridge (17, 5.4%) and Bristol (11, 3.5%). Then come Leicester at ten (3.2%), York and Southampton at nine (2.8%) each and Belfast at eight (2.5%). Other locations have six or less; locations with two or more members are listed in Table 6 and their distribution throughout the British Isles is shown in Fig. 4. Table 6 also lists overseas locations with AEA members and quantifies each location. Most of these members are from Europe (38 out of 49) with 11 from The Netherlands representing the largest single overseas contingent.

What lessons, if any, are to be learnt from these figures? Firstly, that the AEA is still a growing organisation, and must now represent a potentially powerful lobby for environmental archaeology, in Britain at least. This latter fact is underlined by the recent input by the AEA into comments concerning the Hart Report (see Newsletter 12) and the House of Commons Environment Committee (Newsletter 13). Perhaps the time has now come to question whether the AEA should take a more active role in lobbying the issues surrounding envrironmental archaeology and landscape/nature conservation.

A second point is that we should not become complacent about our state or status. The increase in resignations has been pointed out, and we should seek to try to stem this leak. One way of doing this, and improving our service to members, is if people write to members of the committee with suggestions, complaints, etc. Open letters to the Newsletter would also be welcome as would be papers and suggestions for Circaea.

Thirdly, as our overseas membership increases, we should consider ways of improving our service to them. One outstanding issue is the cost, to the member, of sending the annual subscription in sterling. A possibly cheaper alternative would be to send the currency equivalent of £6.00 (allowing an additional sum for exchange rate charges in Britain). If this is cheaper than sending money orders or cheques made out for £6.00 sterling, then please feel free to use this method of payment (see Newsletter 16 for full details of this scheme). Another possible improvement of the AEA's service to overseas members would be if we held meetings overseas more regularly than in the past (to date there has been one meeting, held in the Netherlands). This, however, is very much in the

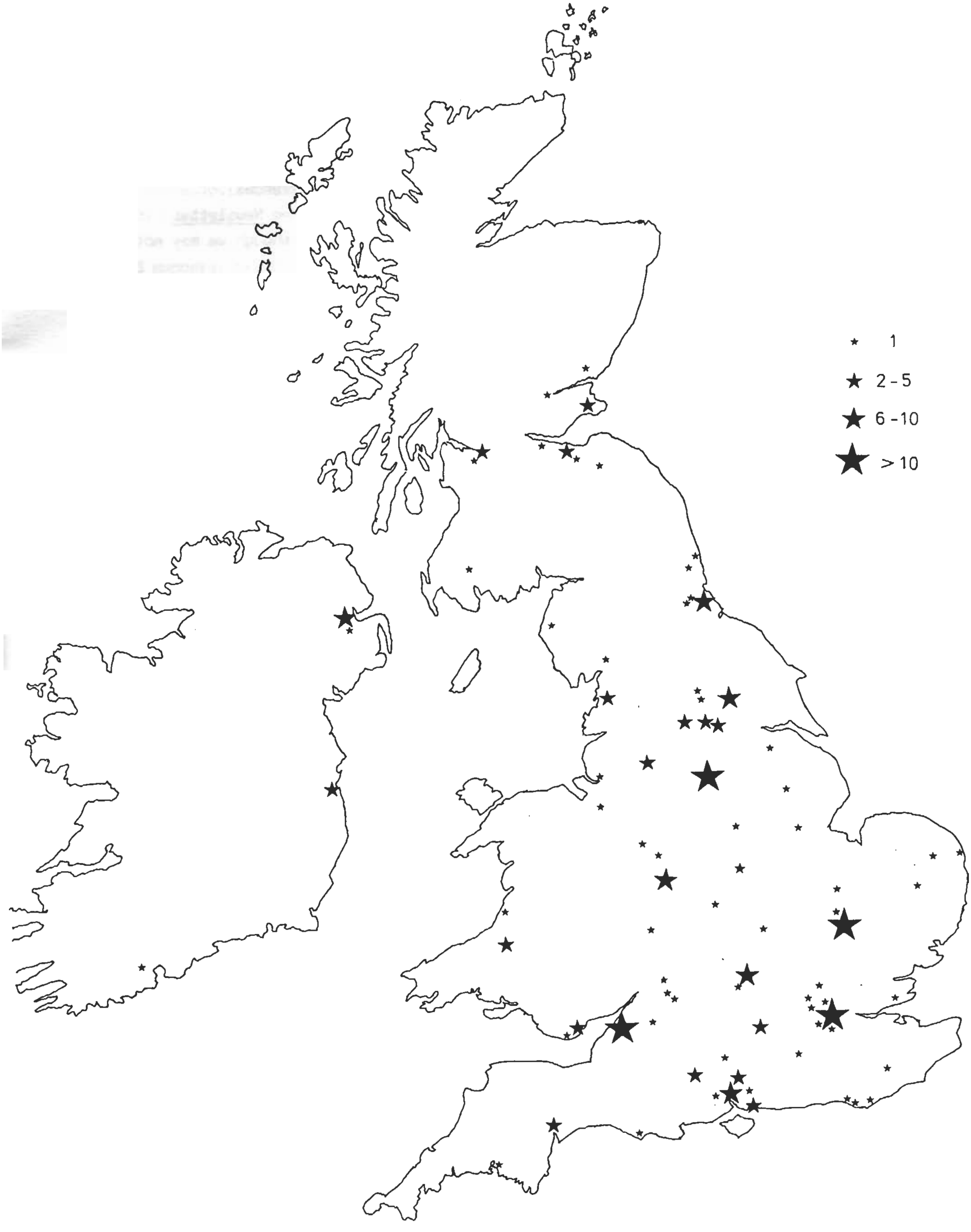

Figure 4. Distribution of AEA members throughout the British Isles (at time of writing). The number of members at each location is indicated by the size of the symbol.

hands of our overseas members to volunteer a venue! (It is to be hoped that the 1988 conference will be held in Denmark; we also have an offer of a meeting in W. Germany.) Also we should consider seeking contributions to Circaea from overseas members, and, perhaps, printing abstracts to articles in other languages, say French and German. Should this certainly be done in the case of the Symposium proceedings?

A recent suggestion for an improvement to our service is for a fund to be set up to help unemployed, low-waged and student members attend meetings and conferences organised by the AEA. Applications to this fund should be made to the Treasurer (see Newsletter 16 for details). This facility will also be available to overseas members, though we may not necessarily be able to contribute 100% of their expenses.

Finally a few words on the organisation of the AEA. The present committee is made up as follows: Mike Allen, Annie Grant, James Greig (elected 1986), Kevin Edwards, Rob Scaife and Mark Robinson - all elected members, and Vanessa Straker (Treasurer), Harry Kenward (Editor, Circaea) and Bruce Levitan (Membership Secretary) - co-opted members. The other editors of Circaea are Allan Hall and Terry O'Connor. The editors of the Newsletter are Vanessa Straker and the present author. I am also AEA representative on the CBA Board, whilst Nick Balaam is the AEA representative on the CBA Science Panel. Any member may nominate another member for a position on the committee. The name and address of the nominee (who must be agreeable to being nominated) together with the names and addresses of the nominator and a seconder should be sent to the Secretary before the AGM (which is held during the annual conference), when voting takes place. Committee members serve for three years on a yearly overlap basis. The three co-opted members are semi-permanent (i.e until they get fed-up with the job!). Other posts are decided by the committee.

The AEA has three types of membership: ordinary membership which is open to anyone with an active interest in environmental archaeology at a subscription of £6.00 per year; institutional membership which costs £9.00 a year; and Honorary Life Membership which is free and is conferred upon those who are considered to have contributed greatly to the practice and reputation of environmental archaeology. Such status is given by vote at AGMs and at present there are two Honorary Members: Professors Geoffrey Dimbleby and Fred Shotton. The AEA committee would welcome suggestions for any other people who deserve Honorary Membership, and will refer such suggestions to the membership at the following AGM.

Table 6. Summary of location of AEA members

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Great Britain: (single-member locations not listed, see Fig. 4)

2 members: Eastbourne, Edinburgh, Exeter, St Albans, Glasgow, Salisbury, Wakefield, Winchester.

3 members: Lampeter, Lancaster, Leeds, Manchester.

4-10 members: Reading (4), Bradford (5), Cardiff (5), Oxford (6), Belfast (8), Southampton (9), York (9), Leicester (10),

over 10 members: Bristol (11), Cambridge (17), Sheffield (19), Greater London (56).

Continental Europe:

Single member countries: Austria (Vienna), Hungary (Budapest), Italy (Rome), Switzerland (Basel).

Two members: France (Gugnon, Besancon Cedex)

Three members: Denmark (Copenhagen [2], Århus), Sweden (Gotteborg, Umeå, Uppsala)

Four members: Eire (Dublin [3], Cork), Norway (Asker, Bergen, Oslo, Stavanger)

Six members: West Germany (Frankfurt, Göttingen [3], Hamburg, Munich)

Eleven members: The Netherlands (Amersfoort [3], Amsterdam [6], Hazerwoude, Utrecht)

Other Countries

Single members: Canada (Ottawa), Israel (Jerusalem), Jordan (Amman)

Two members: South Africa: (Pretoria)

Three members: U.S.A. (Boston [2], Florida [1])

Four members: Australia (Adelaide, Canberra [2], Victoria)

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Notes for contributors

Articles for inclusion in Circaea should be typed double-spaced on A4 paper. Line drawings should be in black ink on white paper or drawing film to fit within a frame 153 x 250 mm. Captions should be supplied on a separate sheet of paper, and labelling on figures should either be in Letraset (or an equivalent) or should be in soft pencil. Half-tone photographs can be accommodated, but authors wishing to make extensive use of photographs, or colour, should note that they may be asked to contribute towards the high cost of production. The editors will modify short contributions to fit the layout and convention of Circaea. The same principle will be applied to idiosyncracies of spelling and punctuation. Scientific articles will be submitted to referees: authors may, if they wish, suggest suitable referees for their articles.

T W O C O P I E S of scientific articles should be submitted. Authorities must be given to Latin names, either at their first mention or in a comprehensive list, and species lists should follow a named check-list. References should follow the so-called modified Harvard convention, but with journal titles preferably given in full, not abbreviated. World list abbreviations will, however, be acceptable if the author has a definite preference. For guidance as to the preparation of material for publication, contributors are referred to The British Ecological Society's booklet 'A Guide to Contributors to the Journals of the BES', and The Royal Society's 'General Notes on the Preparation of Scientific Papers' (3rd ed. 1974, The Royal Society). Text proofs of papers will be provided and should be returned within three days of receipt.

Ten free reprints will normally be supplied to the authors of scientific articles: further copies will be available, if requested at the time proofs are returned, at a charge of 5p per side plus postage.

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