

Environmental Archaeology Unit, University of York

# Research Forum 1996:

## Research directions in the EAU

*Abstracts from a one-day forum  
held at the King's Manor, University of York  
on 30th October 1996*

Environmental Archaeology Unit  
University of York  
York YO1 5DD, UK.

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Compiled by D. Jaques and H. Kenward

Environmental Archaeology Unit  
University of York  
York YO1 5DD, UK.  
25th October 1996

## **Research Forum 1996: Research directions in the EAU - Contributions**

**Peter Hogarth** (Department of Biology, York): *Welcome and introduction.*

### *Research and project student presentations*

**Ian Barnes** (Department of Biology, York): *More questions, more 'Answers': Progress toward the identification of archaeological goose remains using ancient DNA* (supervisors: Keith Dobney and Peter Young)

**Mark Beech** (Departments of Archaeology and Biology, York): *Marine resource exploitation in the southern Arabian Gulf: A zooarchaeological perspective* (supervisors: Keith Dobney and Don Brothwell)

**Linda Hogarth** (Department of Biology, York): *Moles and sex: A biometrical investigation into sex and species differentiation in modern and ancient Talpa* (supervisors: Keith Dobney and Jeremy Searle)

**Susan Haynes** (Department of Biology, York): *Colonisation history of the house mouse as revealed by ancient DNA* (supervisors: Keith Dobney and Jeremy Searle)

**Phil Clarke** (Department of Biology, York): *Holocene extinctions of British beetles: Patterns of decline in geographical, habitat and bionomic groups.* With Harry Kenward (EAU)

**Keith Dobney** (EAU): *Down, but not out: New biological evidence for complex economic organisation in from Filey Roman Signal Station, Yorkshire, complements that from Lincoln in the late fourth century.* With Harry Kenward (EAU), Patrick Ottaway (York Archaeological Trust) and Lisa Donel (City of Lincoln Archaeological Unit)

**Raimonda Usai** (EAU): *Investigating ancient ploughing under Roman deposits at Stanwix fort (Carlisle): Work in progress*

**Harry Kenward** (EAU): *Suspected accelerated in situ decay of delicate bioarchaeological remains: A case study from medieval York.* With Allan Hall and Frances Large (EAU)

**Keith Dobney** (EAU): *Pigs might fly! A pilot exploration of the value of studying enamel hypoplasia in archaeological pig teeth.* With Anton Eryvnyck (Instituut voor het Archeologisch Patrimonium)

**Mark Beech** (EAU): *Domestication revisited: The characterisation of early neolithic animal exploitation at Qermez Dere, Northern Mesopotamia.* With Keith Dobney (EAU)

**Michael Charles** (Department of Archaeology and Prehistory, University of Sheffield): *The 'TRIPOD' project: Palaeoecological investigations in Turkmenistan.* With Keith Dobney (EAU), Chris Gosden (Pitt Rivers Museum, University of Oxford), Colin Merrony (Department of Archaeology and Prehistory, University of Sheffield) and Sarah O'Hara (Department of Geography, University of Sheffield)

**Allan Hall** (EAU): *Mind the gap? Late- and post-glacial deposits at Davenham Church Moss, Cheshire and the problems of funding palaeoecological studies in the 1990s.* With Harry Kenward and Frances Large (EAU)

**Sebastian Payne** (Ancient Monuments Laboratory, English Heritage): *Oh, Brave New World...Thoughts about research and developer-funded archaeology*

**Mike McCarthy** (Carlisle Archaeological Unit): *Contract archaeology and research*

**General discussion:** Concentrating on means of enabling research in a contract environment

**Closing remarks**

## **More questions, more 'Answers': Progress toward the identification of archaeological goose remains using ancient DNA**

*Ian Barnes (Department of Biology, York)*

The remains of geese are commonly recovered from British archaeological sites, but are impossible to identify to species using morphometric methods. Over the last two years, a joint project between the EAU and the Biology Department's Molecular Ecology Laboratory has been working on a method to enable samples to be identified to species and subspecies level. This involves locating a DNA marker in modern individuals and then looking for it in the ancient DNA of archaeological specimens.

Initial work revealed an insufficient level of genetic variation to allow differentiation between the species studied. This year a more variable region of the mitochondrial genome has been investigated and a set of DNA markers found. The next stage involves the application of this technique to material held by the EAU.

These results will be presented in terms of their archaeological and phylogenetic importance. The potential for future collaboration between molecular ecology, ancient DNA and environmental archaeology will be discussed.

## **Marine resource exploitation in the southern Arabian Gulf: A zooarchaeological perspective**

*Mark Beech (Departments of Archaeology and Biology, York)*

*This project is due to begin in January 1997, supported by a University of York DPhil. joint studentship between the Departments of Biology and Archaeology.*

The aim of the project is to attempt to model palaeobiogeographical and palaeoecological data, as well as reconstructing prehistoric marine resource exploitation in the southern Arabian Gulf. This will be achieved by the application of detailed zooarchaeological methods to a series of recently excavated prehistoric/early historic vertebrate assemblages collected by ADIAS (Abu Dhabi Islands Archaeological Survey) from the United Arab Emirates.

The following research questions will be addressed: (i) how do the distribution patterns of modern fish species compare with past distributions (zooarchaeological data)? (ii) do these palaeobiogeographical data reflect major palaeoecological changes taking place within the southern Arabian Gulf ecosystem? (iii) how important were fish and fishing for prehistoric/early historic populations in the southern Arabian Gulf region?

The research will tackle each of these questions by: (i) by examining modern fisheries data, as well as those collected by the author during his fieldwork, (ii) by subsequent analysis of the modern data and comparison with zooarchaeological data in order to model palaeoecological change, (iii) by a detailed examination of the large well preserved assemblages of carefully retrieved archaeological animal bone from the following sites: Dalma (Ubaid period: 5-4th millennium BC), Sir Bani Yas (Early Christian/Pre-Islamic: 5-8th century AD) and Kusht (Islamic: 14-16th century AD).

The rich datasets from these sites provide a unique opportunity to examine diachronic change over a broad time scale. The ADIAS project represents pioneering work in that no previous detailed archaeological survey has been carried out of this entire region of the Arabian Gulf, despite the fact that this area has seen the rise and fall of rich and diverse civilisations. Moreover, almost no work has been undertaken concerning palaeobiogeography, palaeoecology and human economy within this important region. This project aims to redress this balance. A key part of the project will be the extensive collaboration between the following research teams: ADIAS, Biology and Archaeology departments (University of York) and the National Museum of Scotland. The comparative osteological collection created during this project will represent a valuable research tool of international importance.

## **Moles and sex: A biometrical investigation into sex and species differentiation in modern and ancient *Talpa***

*Linda Hoggarth (Department of Biology, York)*

The project is divided into two separate parts. The aim of part 1 was to produce measurements of the post-cranial skeletons of modern *Talpa europaea* to differentiate between adult males and adult females. Part 2 was concerned with the reassessment of available archaeological material with the aim of differentiating between *T. europaea* and *T. minor*.

The following bones of the post-cranial skeleton were measured for 51 adult moles (16 males and 35 females): humerus, radius, scapula, ulna, femur, pelvis, tibia and fibula. Univariate, bivariate and multivariate analyses (principal components analysis and linear discriminant function) were applied to the data in order to differentiate between males and females. Linear Discriminant Function (LDF) gave the best separation of the sexes. More than 95% of the data were correctly classified for all the bones except the pelvis. This method is also easily applied to bones of unknown sex. Bivariate analysis produces good result for the pelvis.

The humerii from deposits at Boxgrove, Sussex (60 specimens), West Runton, Norfolk (65 specimens) and Ostend, Belgium (8 specimens) were measured. The data for Westbury-sub-Mendip, Somerset (6 specimens) were taken from a graph. Only two measurements could be taken because of the fragmentary nature of the humerii. However, it was possible to differentiate between *T. europaea* and *T. minor* with these two measurements, but not to differentiate between the sexes. *T. europaea* from Boxgrove was smaller than the modern specimens. The West Runton *Talpa* species were intermediate in size between *T. europaea* and *T. minor* from Boxgrove. There are two possible explanations for this size difference. Firstly, this species may be *T. fossilis*. Secondly, they may be *T. europaea* but smaller than later examples of this species. As the Boxgrove *T. europaea* is smaller than present day specimens the second explanation may be the correct one. However, there is not enough evidence at present to be sure of the exact identity of the *Talpa* species from West Runton.

## Colonisation history of the house mouse as revealed by ancient DNA

*Susan Haynes (Department of Biology, York)*

An important insight into the colonisation history of a widespread species may be provided by analysis of the present day distribution of genetic forms within that species (phylogeography). However, phylogeographical scenarios remain largely untested. I will use ancient DNA to test two hypotheses for the house mouse (*Mus musculus*).

The first hypothesis relates to the proposal of Auffray and others that the two European subspecies (*M. m. musculus* and *M. m. domesticus*) colonised Europe with human settlers by eastern and southern routes, respectively, in the last 8000 years. To test this scenario I will type mice from up to 50 dated archaeological sites as *musculus* or *domesticus*. The archaeological material is very rarely suitable for morphological discrimination of the subspecies, but can be used to provide ribosomal (r) DNA and other sequences which easily distinguish *musculus* and *domesticus*.

The second hypothesis is that the present day genetic characteristics of European house mouse populations have remains essentially unchanged since colonisation. Detailed studies have shown substantial present day regional differentiation in mitochondrial (mt) DNA; did the geographically widespread mtDNA races that we observe now form *in situ* following colonisation or did they immigrate at a later period? For this study, archaeological material from selected sites will be compared with samples of modern animals collected from the same geographical area.

## **Holocene extinctions of British beetles: Patterns of decline in geographical, habitat and bionomic groups**

*Phil Clarke (Department of Biology, York). With Harry Kenward (EAU)*

Most of the British Coleoptera (beetles) colonised during and following the warming at the end of the Devensian Glaciation (14,000-10,000 BP), since when the relatively stable Holocene climate has probably produced a low *natural* rate of extinction. In contrast, human impacts probably greatly increased the beetle extinction rate. We combined fossil records and current Red Data Book (RDB) status assessments to provide estimates of relative past and future rates of extinctions for different bionomic, habitat, and regional groupings. Pine forest, deadwood, dung and terrestrial predatory groups declined significantly earlier than average, woodland species have an average pattern, and heathland, phytophagous and aquatic beetles show significantly more recent decline. Most RDB Coleoptera known as Holocene fossils in southern England survive there today, but with significant weighting towards the more threatened RDB categories. Many southern rarities may be remnants of a formerly widespread lowland beetle fauna now extinct elsewhere in Britain and may soon be lost without appropriate conservation initiatives in the South.



## **Down, but not out: New biological evidence for complex economic organisation in from Filey Roman signal station, Yorkshire, complements that from Lincoln in the late fourth century**

*Keith Dobney (EAU). With Harry Kenward (EAU), Patrick Ottaway (York Archaeological Trust) and Lisa Donel (City of Lincoln Archaeological Unit)*

Views of the Late Roman period in England have changed considerably in the past few years, with a tendency to acceptance of a survival or resurgence of economic and political organisation despite earlier recession. Although traditional evidence provides some insights into the differential nature of these changes, recent work in Lincoln, on the well preserved late Roman insect and animal bone assemblages from the waterfront, has shown that 'environmental' (in this case biological) evidence can provide unique insights into economic systems.

In this contribution, analysis of the moderate-sized assemblage of hand collected animal bones, and a series of samples containing numerous vertebrate, mollusc and plant remains, from the recently excavated Roman signal station at Filey, North Yorkshire, are shown to provide further evidence for the continuity of complex systems into the late fourth century. The remains of major domesticates show a characteristic 'Roman' diet (although cattle remains are poorly represented) and, along with the limited numbers of oyster shells, clearly indicate that the signal station was systematically provisioned. Numerous small mammal and amphibian remains from the uppermost courtyard deposits have been interpreted as the remains of pellets, probably from barn owls which roosted in the abandoned tower once occupation had ceased. Botanical remains, although scarce, suggest the burning of heather brushwood or heathland turves which must have been brought some distance.

## **Investigating ancient ploughing under Roman deposits at Stanwix fort (Carlisle): Work in progress**

*Raimonda Usai (EAU)*

At present no standard micromorphological indicators of past agricultural practices in archaeological sites have been established. This project aims at describing and interpreting the micromorphological features of ancient cultivated buried below Roman deposits near the Hadrian's Wall.

Undisturbed sediment and soil samples have been collected from natural, cultivated and man-made deposits in three trenches excavated for the purpose in Knowefield, Stanwix, and Tarraby, near Carlisle and in proximity to the Wall.

Samples were impregnated in resin and are now being processed for the production of thin sections for micromorphological analysis. This will include recording textural pedofeatures, organic pedofeatures, horizon boundary, peds, porosity, nodules and other features likely to be useful in characterising cultivated soils.

The project is being carried out in consultation with three major geoarchaeology units in the UK, at the Universities of Stirling, Cambridge and London.

## **Suspected accelerated *in situ* decay of delicate bioarchaeological remains: A case study from medieval York**

*Harry Kenward (EAU). With John Carrott, Allan Hall and Frances Large (EAU)*

An evaluation exercise at 44-5 Parliament Street, York, in 1994 revealed evidence of what appeared to be recent decay of organic remains in medieval deposits. A research project was initiated by York City Council, with funding from Marks and Spencer plc and support from English Heritage, to explore this phenomenon and to provide a baseline for further monitoring of in-ground preservation.

Sediment characteristics and preservational condition of plant remains, eggs of parasitic worms and insect macrofossils have been recorded for samples from four faces of a 3 x 3 m trench cut to 2 m below the floor, and limited investigations of samples from a borehole which reached a further 4.5 m were also possible.

The conclusion drawn during the evaluation, that fossils which had been in good condition had recently undergone a phase of decay, could not be proved objectively but is still considered to be correct. The effect had penetrated throughout the top 2 m of the stratigraphy, but appeared to fall off beneath this. It is suggested that the most likely cause is dewatering during construction of the recently-demolished building, combined with the down-movement of salts from an overlying concrete slab (calcium sulphate efflorescence was present in voids to almost 2m depth).

Although the type of decay seen at Parliament Street is unusual, it is suggested that it would be most unwise to assume that at least the upper few metres of archaeological deposits in York are not generally threatened. Much of the city is penetrated by cellars, and much of its surface has been covered by concrete, while the use of crushed limestone for backfill may also pose a threat to the continued survival of organic remains. The poor preservation typically of post-medieval deposits in York may not, as we have assumed, be a result of relatively dry depositional conditions, but of recent reduction in water content. A programme of research to investigate and monitor in-ground decay should be initiated as a matter of urgency.

## **Pigs might fly! A pilot exploration of the value of studying enamel hypoplasia in archaeological pig teeth**

*Keith Dobney (EAU). With Anton Ervynck (Instituut voor het Archeologisch Patrimonium, Flanders, Belgium)*

Abnormal incremental lines (enamel hypoplasia), recorded from archaeological human teeth, have been used to throw considerable light upon the health of past populations since they are known to reflect a wide range of pathological conditions, of both a nutritional and infectious nature. By measuring their severity and position on the tooth crown it has also been possible, in some instances, to reconstruct chronological patterns of physiological stress within and between contrasting samples during the period reflected by tooth crown development. The study of enamel hypoplasia to reconstruct past physiological stress has rarely been undertaken on non human material, however.

This project aims to develop further methodological procedures (established on human material) in order to study enamel hypoplasia in one of the most important domestic animals - the pig - in an attempt to explore whether these developmental anomalies can be used to address important questions regarding multi-farrowing, differences or changes in husbandry regimes, and the local utilisation of woodland resources in the past. The hypothesis we wish to test is that physiological stress during tooth development (brought about, for example, by a change of diet or decreasing food availability, such as that linked with deforestation and/or changing husbandry regimes) will be reflected in the frequency and/or severity of enamel hypoplasia on the teeth. By recording the position and severity of these events on the teeth, we can attempt to reconstruct a retrospective chronology of insults which can then be compared between sites where large samples of pig teeth have been recovered.

## **Domestication revisited: The characterisation of early neolithic animal exploitation at Qermez Dere, Northern Mesopotamia**

*Mark Beech (EAU). With Keith Dobney (EAU)*

The site of Qermez Dere on the outskirts of the town of Tel Afar, near Mosul in North Iraq, was excavated between 1986 and 1990 (as a rescue excavation) at the request of the Iraqi Department of Antiquities and Museums. It was a small village settlement dated to the proto-neolithic or very early aceramic neolithic period. Dates (uncalibrated C14) ranged from a just before 8000BC to the mid eighth millennium BC, a period which witnessed the beginnings of the transition from hunter-gathering to the domestication of selected plants and animals. The recent allocation of a Small Grant from NERC has, at last, enabled a detailed study of the animal bone material from this important site to be undertaken.

The site's importance can be understood in terms of its location and date. It is the earliest permanent settlement site (along with Nemrik, excavated at the same time by Professor Stefan Kozłowski, University of Warsaw) in Northern Iraq outside the mountain and piedmont zone of NE Iraq. Settlement sites of such a date are extremely rare anywhere in the Near East. Qermez Dere is a significant site in unravelling the story of the beginnings of sedentary village life and the beginnings of farming. The strange architecture of the settlement bears on the cultural and social development of early sedentary communities, and their exploitation of local resources by hunting and gathering gives a very important date after which cultivation and herding began. The combination of tight stratigraphic and contextual control, rigorous collection and quantified sampling make the vertebrate assemblage from this small site unique.

Preliminary work on the vertebrate remains has highlighted strong similarities between this assemblage and other so-called 'broad-spectrum' economies of similar date from the Near East, all of which are characterised by the predominance of gazelle, fox, hare and often numerous bird species.

Detailed analysis of the vertebrate remains from Qermez Dere will closely define the economic basis of this sedentary early neolithic hunter-gatherer community and illuminate subsistence patterns of pre/proto-domestication communities in Northern Mesopotamia. Specific questions to be addressed include:

- the determination and quantification of the taxa represented
- identification of possible seasonal variation of exploitation
- the nature of the immediate environs of the site and the range of exploitation
- characterisation of the deposits over the site and the identification of patterns of activity and refuse disposal
- how this assemblage fits into the wider framework of late epipalaeolithic/early neolithic animal exploitation in the Near East particularly in regard to the 'broad-spectrum' concept.

## **The 'TRIPOD' project: Palaeoecological investigations in Turkmenistan**

*Michael Charles (Department of Archaeology and Prehistory, University of Sheffield). With Keith Dobney (EAU), Chris Gosden (Pitt Rivers Museum, University of Oxford), Colin Merrony (Department of Archaeology and Prehistory, University of Sheffield) and Sarah O'Hara (Department of Geography, University of Sheffield)*

Southern Turkmenistan has been a focus for Soviet archaeologists over the last forty years and now represents one of the areas with the best known archaeological sequences in the generally little known area of central Asia. The Soviet work, however, has had several biases, concentrating on the periods from the Neolithic onwards and being primarily concerned with the internal organisation of settlements and their material culture, rather than their environmental settings or their subsistence base.

The emergence of Turkmenistan as an independent Russian state has provided a unique opportunity to develop more extensive and potentially exciting avenues of research in a part of the world where, as a result of long years of restricted access, little systematic palaeoecological research has ever been undertaken. Through the auspices of the Director (Dr Kakamurad Kurbansakhatov) and Assistant Director (Sergei Loginov) of the newly formed 'Southern Turkmenistan Archaeological Expedition', selected members of the original British research team working at the site of Jeitun, in the Kara Kum desert, were invited to undertake future, long-term, archaeological research in the Sumbar and Chandyr valleys (Kopet Dag mountains) and, in the future, around the original shores of the Caspian.

The present belief that the origins of agriculture in the old world centre around the so-called 'fertile crescent' of the Levant, Anatolia and the Zagros mountains is borne out by abundant evidence from epipalaeolithic and early neolithic sites of that region. However, this is more a reflection of the distribution of previous work than a real picture. The piedmont and southern desert zone of southern Turkmenistan is made up of a complex mosaic of environments which have changed continuously since the beginning of the last glaciation and have probably formed a focus for human settlement throughout that period. This area is one of the eight so-called 'gene centres', identified by Vavilov (i.e. very rich in plant and animal genetic diversity), and has been suggested as a possible 'cradle of agriculture'. The area today still contains a number of the wild progenitors of domesticated animals and plants, including wild asiatic sheep, the Urial sheep, the wild bezoar goat, wild boar, wolf and wild cat, as well as barley, pulses and a range of fruit trees, including pomegranates, apricots and almonds.

The topography, climate, and native plants and animals of southern and western Turkmenistan are practically identical to those of the Near East, and merely form an easterly extension of the 'crescent' region. It is therefore possible that evidence for the beginnings of agriculture may well be found much further east than previously thought, where a long period of experimentation with local plants and animals may have occurred independently. Alternatively, it may be the case that this exploitation of novel resources was rapidly adopted from the subsistence strategies of neighbouring southwest Asia.

'TRIPOD' aims to investigate the moves towards agriculture in Turkmenistan through an extensive survey, and targeted excavation, of sites (including caves and rock shelters), initially in the Sumbar and Chandyr valleys. We propose to undertake a major research project over the next five years to locate deposits of late palaeolithic, epipalaeolithic and early neolithic date.

## **Mind the gap? Late- and post-glacial deposits at Davenham Church Moss, Cheshire and the problems of funding palaeoecological studies in the 1990s**

*Allan Hall (EAU). With Harry Kenward and Frances Large (EAU)*

Late-glacial and early post-glacial peat deposits in a small closed basin at Davenham, near Northwich, Cheshire, were the subject of an evaluation by Manchester University Archaeology Unit in 1995 prior to the construction of a by-pass on behalf of Cheshire County Council.

The evaluation exercise established the presence of areas of decayed pine and other timber, and of birch bark, with roughly contemporaneous small patches of charcoal and caches of hazel nutshells. Dating by radiocarbon assay pointed to a broadly mesolithic context. On this basis, it was recommended that further excavation took place to explore the 'archaeology' further, and this was undertaken by Lancaster University Archaeological Unit in late 1995 and early 1996. The EAU was contracted to offer advice on further sampling and analysis and an assessment programme of bioarchaeological analysis was carried out by Palaeoecology Research Services in the summer of this year. These analyses comprised investigations of pollen from a deep sequence of about 3 m of peat from the deepest part of the stratigraphy, together with analyses of plant and insect macrofossils from this sequence and from several more 'marginal' sections (all the material was, unusually, available from open sections in trenches or trial pits rather than from cores). The bioarchaeological work was supported by further radiocarbon (AMS) dates from the deep peat sequence and from one of the marginal sequences.

The results of the analyses show that peat initiation was already underway before 11,000 BP (uncalibrated) and that at the centre of the basin peat growth ceased not long after 7,900 cal BP. Much of the record is therefore of plant and invertebrate communities of the late-glacial and early post-glacial, a period of considerable climatological interest.

This site affords a rare opportunity to study this part of the late Devensian/early Flandrian in some detail, albeit from deposits with largely locally-derived fossil assemblages, in an area for which relatively few such sequences exist. However, the question of the 'archaeological context' remains problematic: in the absence of unequivocal evidence for human activity (the charcoal may be of natural origin, the hazel nutshells buried by small mammals—some are 'holed' by rodents!) it is difficult to make a case for funding by the developer.

## **Oh, Brave New World...Thoughts about research and developer-funded archaeology**

*Sebastian Payne (Ancient Monuments Laboratory, English Heritage)*

There are probably many who think that research and developer-funded archaeology are virtually incompatible, and who view developer-funded contract work as boring, routine service work, useful only to keep the wolf from the door until the next long-hoped-for research grant.

The purpose of this contribution is to suggest that this attitude is unnecessarily negative and damagingly self-fulfilling. Several points need to be made. Research isn't a separate activity; it is an attitude of mind, an approach to asking and trying to answer questions. Almost any work can be turned into worthwhile research by looking for the opportunities and by asking the right questions. Developer-funded work done without a clear understanding of the research framework within which it sits will almost certainly result in missed opportunities, work of poor quality, and results that are poor value. Why should anyone be involved in developer-funded archaeology unless it is research? This doesn't mean that this work is always exciting - routine and boredom are an almost inevitable part of most research projects.

A common response at this point is the argument that this is all very fine but doesn't lead to the lowest bid - that anyone who works in that way won't get the jobs. But work done with a research approach and framework is likely to be more cost-effective, because it makes choices more intelligently and recovers information of higher quality; and it's likely to be more interesting to do. Often no added costs are involved; where they are, it is often possible to find funding.



## **Contract archaeology and research**

*Mike McCarthy (Carlisle Archaeological Unit)*

Much has been written about problems besetting archaeology at present, as works by Biddle, Hodder, Tilley, Carver and others testify. Most of the papers have been written from an academic standpoint. My paper will point up some of the problems from the contracting archaeologist's angle. Although I will not refer to environmental archaeology, seeds or insects, it is nevertheless the crucial context within which this vitally important subject rests.

Research used to be the prime reason for archaeological fieldwork. Nowadays most field archaeology is dominated by rescue work and the whims of the developer. Competitive tendering and the overwhelming desire for archaeologists to win the tender brings with it a number of problems, some of which will be spelled out.

The rapid growth of the archaeological profession has created a hydra in which the various heads exist in an uneasy alliance, and are not in communication. Units are not talking to universities except where specialisms, mostly palaeoenvironmental, are concerned. Universities are certainly not talking to units, and are turning out graduates unfitted for their chosen profession.

In the world of field units, research barely figures because their *raison d'être* is reactive and not proactive. Are units fitted to assess their research potential? Would an RAE-type exercise be helpful if applied to units? Are units dinosaurs from the Age of Rescue? Should universities be fundamentally rethinking what is taught and why they are teaching it?

We need to recognise that a way forward is co-operation, a point Martin Carver and Chris Tilley have both made. Consortia and partnership should be the buzz words of the next generation.

*The current staff of the EAU*

**Ancient Monuments Laboratory Fellows**

|               |   |
|---------------|---|
| Keith Dobney  | vertebrates                                 |
| Allan Hall    | plant remains                               |
| Harry Kenward | Director; invertebrates, especially insects |
| Raimonda Usai | soils and sediments                         |

**Palaeoecology Research Services**

|                |  |
|----------------|--|
| John Carrott   | microfossils, particularly parasite eggs; molluscs and computing |
| Michael Issitt | technician   |
| Deborah Jaques | vertebrates  |
| Frances Large  | insects  |

**Other staff and research students**

|              |   |
|--------------|---|
| Mark Beech   | Research Assistant, Qermez Dere project |
| Susan Haynes | postgraduate student                    |
| Ian Barnes   | postgraduate student                    |

The Unit's Line Manager in the Department of Biology is Professor Alastair Fitter.

## About the EAU

The Environmental Archaeology is a research group within the Department of Biology at the University of York. It was established in 1975 with funding from the Historic Buildings and Monuments Commission (Department of the Environment) and the Leverhulme Trust. Currently four Research Fellows are funded by the Ancient Monuments Laboratory of English Heritage, and a variable number of other staff (typically four or five) are supported from commercial contracts and English Heritage project funding. Strong contacts have grown with other institutions including many archaeological units and university departments.

The Unit strives towards an integrated approach to environmental archaeology, drawing together information from many aspects of the subject, including studies of soils and sediments, pollen, plant macrofossil remains of all kinds, invertebrates (including parasitic nematodes, insects and other arthropods, and molluscs), and vertebrates. We believe that the integration of evidence is crucial in building a more solid foundation for the interpretation of the evidence as a whole from archaeological deposits, leading to the recovery of much more valuable information than work on single groups or isolated parallel studies.

The Unit, together with the Environmental Archaeology Laboratory at Durham, constitute the Northern Regional Team of AML contractors. The co-ordinator of the Northern team is based at York. Both groups are charged with providing advice concerning all aspects of environmental archaeology, carrying out assessments and main phase site projects, and executing programmes of research and review.

The EAU contract group, *Palaeoecology Research Services* (PRS), is able to organise and execute environmental archaeology studies of most kinds, including evaluations, drawing on a wide range of expertise. More information can be obtained from the staff of PRS (01904 443846, fax 443850).

The Departments of Archaeology and Biology at the University of York in 1995 formed the interdisciplinary *Centre for Palaeoecology*, an umbrella for the activities of the EAU and other researchers in the broad areas of palaeoecology and environmental archaeology.

A list of publications and reports by EAU staff and associates is available free on application to the Director, and is also accessible through the internet.

The Unit's web page can be found at <http://www.york.ac.uk/inst/eau/>.

## List of participants

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Umberto Albarella, *Department of Ancient History and Archaeology, University of Birmingham*  
Liz Ashby, *Department of Biology, University of York*  
Eleni Asouti, *Department of Archaeology and Prehistory, University of Sheffield*  
Denise Bacon, *Department of Archaeology and Prehistory, University of Sheffield*  
Ian Barnes, *Department of Biology, University of York*  
Andrew Bates, *Department of Archaeology and Prehistory, University of Sheffield*  
Jennifer Blank, *Department of Archaeology and Prehistory, University of Sheffield*  
Doreen Bowdery, *Australian National University*  
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Don Brothwell, *Department of Archaeology, University of York*  
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