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## CONFERENCE PAPER SUMMARIES

The following summaries have been provided by some of the speakers at the AEA's Spring Meeting held at the University of Birmingham, 17th April 1996

### The LAXS approach to studying osteoporosis in archaeological bone

Osteoporosis is a metabolic disease of bone in which the equilibrium which normally exists between bone turnover processes is disrupted, resulting in a net loss of bone.

Bone consists of a hard outer shell, the cortex, and a rigid framework of bony struts, trabecular bone. Trabecular bone is far more metabolically active, so it is in this region where bone loss will first be seen.

Several scanning techniques were compared on 30 femora and 25 vertebrae. Low Angle X-ray Scattering (LAXS) is a technique being developed at the Department of Medical Physics, University College London, for early detection of osteoporosis. This is the first time the technique has been applied to archaeological bone. The technique can be configured to measure trabecular bone density only. Data obtained contain information that can be used to determine the type and amount of minerals present, so diagenetic changes could be detected.

Measurements were also made using Dual Energy X-ray Absorptiometry (DEXA) and photodensitometry techniques. The results were compared with bone mineral density values which were obtained through the physical removal of the trabecular bone. LAXS gave the most accurate results—correlation coefficients of  $r=0.8$  and  $0.9$  respectively for femora and

vertebrae, compared with  $r=0.64$  and  $r=0.74$  for DEXA, and  $r=0.78$  and  $0.85$  for photodensitometry.

LAXS could prove a valuable tool for those wishing to carry out a range of studies on archaeological bone.

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### Sub-fossil Mollusca: improving environmental interpretation

As in other subfossil or fossil analyses, the interpretation of subfossil Mollusca relies, to a greater or lesser degree, on a 'uniformitarianist' approach, at the species level (autecology), the community level (synecology), or both. The notion, however, that present-day ecological preferences or associations can simply be applied to the past inevitably leaves a nagging doubt. Recently, Evans (1991) and Evans *et al.* (1992) have sought to identify recurrent molluscan taxocenes, particularly in Holocene overbank alluvium, and to rely on internal taxocene characteristics for interpretation rather than direct species or habitat analogy. To date, eight taxocenes have been recognised from such contexts. The approach is still analogous but at a more general level, relying on concepts such as species diversity, habitat diversity and succession, and the interrelationship of all three. To a large degree, interpretation proceeds without reference to named species.

In order to determine whether taxocenes had a numerical basis the data from three molluscan profiles through Holocene overbank alluvium at Kingsmead Bridge on the River Wylye, Wiltshire, were analysed using Detrended Correspondence Analysis (DCA). Data were entered into a spreadsheet on a species-by-sample basis and DCA used to group similar

samples. Furthermore, the data set was transposed and DCA used to group similar (i.e. similarly behaving) species.

Species ordination was revealing in that it demonstrated that past associations between species were virtually identical to those that would be expected in the present day. Six groups were identified: Group A, consisting solely of *P. muscorum*, normally a xerophytic species; Group B, consisting of catholic Mollusca; Group C, consisting of catholic Mollusca with a preference for more shaded ground; Group D, Mollusca with a preference for wet ground; Group E, consisting of amphibious Mollusca; and Group F, consisting of aquatic species with a tolerance for 'slum' conditions. In effect, species ordination demonstrates that the ecological relationship between species in the past is similar to that in the present. Uniformitarianism at a general species level, proves valid.

However, research on modern molluscan distributions in wetland areas demonstrates that it is difficult to take uniformitarianism to the level of habitat equivalence. It is difficult to compare molluscan data from present-day non-alluviating wetlands to subfossil data from alluviated wetland contexts. Although at the level of ecological relationships between molluscan species uniformitarianism seems valid, non-identity between past and present environments still suggests that the interpretation of past environments avoids strict habitat analogy.

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#### *Evidence for food and fodder from plant remains at Causeway Lane, Leicester, U.K.*

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(Editor's note: This paper was presented at the Spring meeting of the AEA at Birmingham University, April 17th 1996, but is more substantial than the summaries presented by other authors, and so is included here as a 'short contribution'.)

#### Introduction

A large urban excavation at Causeway Lane, Leicester (National Grid Ref. SK 584 048) was carried out by the Leicestershire Archaeological Unit from April to September 1991, directed by Aileen Connor, and with Richard Buckley as project manager. This was funded by the Inland Revenue, the developer of the site. The excavation was located in the NE quarter of the previously walled area of the town (Connor 1992) not far from the sites collectively known as The Shires (Lucas and Buckley, forthcoming). The site produced Roman and medieval features including some evidence of buildings of both periods and abundant evidence of backyard activity with rubbish pits, cesspits and wells. The excavation provided an opportunity to take bulk samples for the recovery of plant and animal remains. The objective was to sample deposits with good bioarchaeological potential, and covering all phases and types of feature if possible. A total of 277 context groups was sampled amounting to some 12,000 litres (15 tonnes), of which the Roman deposits comprised about half the volume. All the samples were processed in a 'York' tank (Kenward *et al.* 1980).

The deposits encountered at this site were free-draining sands and gravels above Mercian Mudstone so that, although bone was well preserved and plant remains were charred or mineralized, there was only a very little waterlogged material from the deeper features. The range of remains recovered included fish bones and scales, mineralized fly puparia and woodlice, eggshell, oysters, charcoal and plant macrofossils. In addition to samples taken for a wide range of macrofossils, samples for analysis of pollen and parasite eggs were also taken (Monckton 1995). It was hoped that the results would add to evidence from The Shires sites, particularly to The Shires plant macrofossils (Moffett 1993). The analysis of the plant and