Longstone Edge, Derbyshire (CAS Site 472): assessment of molluscs

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1. Introduction

Excavation of the two monuments at this site was undertaken in 1996 by CAS. Peter Reeve, and subsequently Alex Gibson, were the Project Managers.

Both structures were, in their latest phases, constructed of limestone and soil, whilst the lower contexts consisted only of stone. Both structures sealed thin buried soils developed on Carboniferous Limestone. Barrow 1 proved to be a complex monument, originating as a Neolithic excarnation platform, and continuing as a burial site in the Beaker period and Bronze Age, with inserted burials of Roman date. An extensive series of samples was collected for palaeoecological analysis.

2. Factual data

2.1 Quantification of material

Nineteen samples were collected and processed specifically for analysis of molluscs (Table 1). In addition, shell was extracted from the flots and residues from 227 bulk samples. Hand-collected material described as "marine mollusc shell" was also received for examination.

2.2 Data collection and method statement

The dedicated mollusc samples (1 kg, air-dry) were wet-sieved over a 0.5mm mesh. The retents were dried, and four 9cm petri dishes per sample were rapidly scanned under a binocular microscope at low power (up to x 45). Taxa noted are listed in Table 2. Shells and fragments (2-4mm and >4mm) were extracted without magnification by CAS staff from the flots and residues of 221 bulk samples, with material >1mm from a further 6 samples. Large shell fragments were collected by hand during excavation.

3. Assessment of potential for analysis

3.1 Shell from samples taken specifically for mollusc analysis (Table 2)

The samples showed little sign of intrusive material being present, though fibrous roots were noted in some samples. In sample 5173 (1004), a disturbed superficial deposit (Table 1), fibrous roots were abundant and beetle remains and uncharred fruits of *Cirsium* sp were present. In 5180 (2073), mound material, roots and sub-spherical melanised fungal sclerotia were common.

Shell preservation was extremely variable. Some contexts included abundant well-preserved shells, but in others only weathered, pitted and perforated shells and fragments of large species were noted. This is thought to reflect, in part, the duration of exposure of shells on the soil surface prior to burial (though in superficial and relatively recent contexts the leached peaty

matrix and/or the effects of acid rain are probably implicated). This variability may have some potential for evaluating the duration of phases of barrow construction.

The assemblages seem remarkably homogeneous in composition, dominated consistently by *Discus rotundatus*. Evans (1972, 287 and 308-310) includes samples of this type in his group of 'limestone scree' faunas, composed of species commonly associated with woodland. In this situation, however, some species appear to have been inhabiting shaded, moist cavities within limestone rubble, which mimicked woodland conditions (from a snail's point of view), whilst others were rupestral, living on rubble surfaces. Open conditions and stone-strewn surfaces are apparently indicated throughout.

So far as the writer can ascertain at present, the only other study of molluscs from a Derbyshire barrow is that by McMillan at Glebe Low, Great Longstone (Appendix II in Radley 1966). She found that a sample from the 'Bronze Age turf-line' included no shells, but a substantial shell assemblage came from a secondary burial. This was dominated by *Discus rotundatus* and *Vitrea contracta*, closely resembling assemblages from the present site.

The preliminary identification of *Pyramidula rupestris,* (yet to be verified by comparison with modern reference shells), is of some interest, for this species has apparently not been reported from Pleistocene and post-glacial deposits in mainland Britain. It occurs in limestone districts today, living on dry, exposed rocks. Its apparent presence here is unsurprising, for Longstone Edge would provide exactly the type of habitat required by this snail, but the determination would have some importance as a biological record.

No analysis of samples from superficial deposits and 'subsoil' (Table 1) is proposed, since only very sparse assemblages were obtained. The taphonomy of the samples from 'mound material' and from cists is uncertain, though shells were probably derived, in part, from re-working of soils at the sites. Again, no further work is proposed on samples from these contexts.

Quantitative analysis of samples from buried soils is thought to be worthwhile: first, to produce full species lists and to define any differences between the successive phases of the two barrows; second, and perhaps more importantly, to assess shell preservation in detail, with a view to obtaining taphonomic and perhaps chronological data. The key point to be determined first is whether variation in preservation between samples from the *same* buried soil is greater or less than that between samples from *different* buried soils.

Samples to be analysed will be 5147, 5148, 5151, 5152, 5155, 5156, 5158 and 5159: 8 samples in total.

3.2 Shell from bulk samples

221 samples of shell extracted from bulk samples were also received for examination. These had been sorted from 2 - 4mm and >4mm fractions of flots and residues. Hence they included only shell fragments from large species and adult snails, and were unsuitable for analysis. However, rapid scanning of these samples was thought worthwhile, in order to see whether any assemblages markedly different from those previously seen in samples taken specifically for mollusc analysis (Table 2) were present at the site. In fact, these samples proved to be very consistent in composition, including an identical range of larger species to the samples listed in Table 2. *Discus* and *Cepaea* were predominant, with *Helicigona, Oxychilus* and Clausiliidae.

In addition shell fragments >1mm from bulk samples 5028 (2001), 5070.9 (75502), 5106 (75502), 5111.1 (1055/1056), 5112 (2058) and 5115 (1082) were received. These again included predominantly *Discus*, with Clausiliidae (mostly very badly abraded and/or apical fragments) and *Cepaea* whorl fragments and occasional apices.

More puzzling were the objects separated and labelled as "slug plates" or "slug pellets". These were present in 5070.9, common in 5106 and very abundant in 5111.1. The writer is confident that these were not the plates of limacid slugs, which they resembled superficially in size and form; but he is unable to identify them. Given that the one sample of unsorted residue received (from 5111.1) included abundant small limestone fragments, crinoid ossicles and other Carboniferous fossils, mostly mollusc/brachiopod shell fragments, his best guess is that these are some sort of Carboniferous Limestone fossil. They are unlikely to be of archaeological significance.

No further work on material from the bulk samples is proposed.

3.3 'Marine mollusc shell'

10 samples described as 'marine mollusc shell' were examined (72050, 1004; 72072, 1011; 5090.1, 1058; 5083, 75502; 5107.2, 75502/03; 5070.14, 1052; 5068, 1019; 5089, 1052; 5103, 1057; 5026B, 1004). In all cases these were of fossil shell from the Carboniferous Limestone; the more complete and unabraded fragments were of productid brachiopods. They are assumed to be of local origin.

There is a possibility that some of these fossils were intentionally placed, but further work on them is not thought necessary.

4. Up-dated Project Design

4.1 Aims and objectives

These are two-fold:

(a) to analyse mollusc shell assemblages from eight selected contexts (5147, 5148, 5151, 5152, 5155, 5156, 5158 and 5159) to provide data on local environmental conditions, and to detect local habitat change through time (if any)

(b) to evaluate differential shell preservation so as to see whether it might have any use as a relative dating technique.

(a) will form an integral part of the present project; (b) may, or may not, lead on to a separate research project, although it is hoped that results may be available in time to feed back data to the present project.

4.2 Methods statement

The eight samples selected for analysis will be sorted under a binocular microscope at low power, extracting all shells and fragments with apices > 0.5mm. Shells and fragments extracted will be identified by comparison with modern reference specimens, and with reference to standard published texts on molluscs.

Evaluation of the preservation state of shells in each sample will be qualitatively recorded, noting degree of abrasion, loss of surface ribbing and striations, and degree of pitting and perforation. If there proves to be more variation in preservation *between* contexts than *within* them, a Project Design for a research project will be developed to quantify this variation, using scanning electron microscopy of shell surfaces. An attempt will then be made to attach a time-scale to shell abrasion, surface dissolution, pitting and perforation by means of experimental techniques involving exposure of modern mollusc shells to weathering in a comparable environment.

4.3 Task list and summary of timing and costs

1. Technician. Sample sorting. Eight samples. 5 days at standard EH rate for this level of work.

2. P. Murphy. Identification of shell assemblages, and report. 10 days. No costs involved, subject to EH approval of project.

3. P. Murphy. Evaluation of shell preservation. To be done concurrently with above. 1 day. No costs involved, subject to EH approval of project.

Any further work thought potentially profitable beyond this would form part of a separate project.

References

Evans, J.G. 1972
Land snails in archaeology. Seminar Press: London.

Radley, J. 1966
Glebe Low, Great Longstone. *Derbyshire Archaeological Journal* 86, 54-69.