HMK REPORT 3237

LAND MOLLUSCA AND OTHER PALAEOENVIRONMENTAL EVIDENCE FROM CONDICOTE HENGE, GLOUCESTERSHIRE

187

Martin Bell.

This henge monument lies at between 185 and 207m O.D. on the Great Oolite of the Cotswolds (Geological Survey, Sheet 217). Excavation of the inner of two known ditches and part of the interior were carried out by Alan Saville in 1977. He took a column of samples for mollusc analysis from the west face of the ditch (Fig.) and a single sample from the buried soil below the bank (Fig.).

The methods of mollusc analysis employed are basically those outlined by Evans (1972) and the nomenclature follows Waldén (1976). The usual difficulties were experienced in separating the Zonitidae, particularly Vitrea contracta from Vitrea crystallina although it was obvious that the former was very much more abundant. Similar difficulties were experienced in distinguishing Carychium minimum from Carychium tridentatum although examination of the internal lamella of selected specimens (Kerney and Cameron 1979, p.57) suggested that there were only a few examples of the former as one would expect in this terrestrial situation. The single example of Vertigo alpestris should be regarded as a tentative identification based on the presence of only four teeth.

The results are shown in Table I and as histograms of relative abundance (Fig. 2) in which each species is plotted as a percentage of the total individuals excluding Cecilioides acicula which burrows at depth and is plotted as a percentage over and above the rest of the fauna. In the course of mollusc analysis the ditch sediments were divided into four fractions by sieving and the proportions of these fractions are represented diagramatically in Fig.2 along with the number of molluscs and the grams of charcoal per kilogram.

The Buried Soil

Within the excavated area the tail of the henge bank only survived to a depth of 10cm. and below it there was a thin buried soil. There were few molluscs in this and they included the Medieval introduction Candidula gigaxii. For this reason, and because of the great contrast between the fauna and that from the lower part of the ditch, it is thought likely that the original mollusc fauna no longer survives, possibly because of decalcification. That being so the few molluscs which were found are probably intrusive through the shallow bank, and evidence of the pre-henge environment is regrettably absent.

The Ditch

The stratigraphy of the ditch sediments at the point of sampling was as follows (Munsell colours moist):-

Depth	
0- 15cm	Turf and topsoil
15- 90cm	Reddish brown loam (5 YR 4/4) with abundant small stones. Tertiary fill of ditch.
90-100cm	Stone accumulation horizon.
100-120cm	Reddish brown loam (5 YR 4/4) with numerous large and small stones.
120-140cm	Reddish browh (5 YR 4/3) stone free loam, interpreted as a stand-still phase of soil formation. The layer contained Romano-British sherds.
140-155cm	Stone accumulation horizon.

155-170cm	Reddish brown (5 YR 4/3) loam with abundant medium and large stones.
170-190cm	Reddish brown (5 YR 4/2) loam with abundant medium and large stones, pottery, animal bone and much charcoal on which a radio-carbon determination of 1770 ± 80 bc has been made.
190-235cm	Dark brown (7.5 YR 4/4) loam with abundant medium and large stones, the number and proportion of which increase to the base.

Samples for mollusc analysis were taken beginning at a depth of 80cm down to the bottom of the ditch. Material above 80cm was regarded as recent infill and accordingly was not sampled. Sampling in the field was done at rather rigid intervals usually of 10cm so there may be some tendency for individual samples to cross the boundaries between layers.

All the sources of evidence suggest we can make a fairly clear dividing line in the ditch sediments at c. 140cm. Below this are the primary fill layers which contain a high proportion of limestone pieces with 50% or more by weight larger than 6.75mm (Fig.2). The proportion of these coarse fractions decreases upwards just as the number of molluscs per kilogram increases: both things one would expect in a sedimenting feature. Peak values for mollusc abundance were encountered in the layer at 180-190cm which, despite the absence of evidence for sorting, probably represents a stable horizon of reasonable duration.

The mollusc fauna from below 140cm is a diverse one in terms of the range of species and a rich one in terms of numbers. The main species present here - *Carychium tridentatum*, *Vitrea contracta*, *Aegopinella pura*, *Acanthinula aculeata* and *Discus rotundatus* - are all placed by Evans

(1972, p.194) in his shade-loving grouping. Members of this grouping form 65-90% of the fauna below 140cm. There is, however, a proportion of species with more catholic ecological preferences and between 3 and 14% which prefer open conditions. The latter include Vallonia excentrica, Vertigo pygmaea, Pupilla muscorum and Helicella itala. The most abundant species normally regarded as open country is Vallonia costata (2-12%) but this is not confined to open habitats.

We now need to consider to what extent this basically shade-loving fauna has been influenced by local conditions within the ditch. One might expect this to have presented a more shady, somewhat damper, micro-environment than its surroundings and, as it sedimented, this might have supported lusher vegetation. A further problem, in the context of this stony primary fill, is that the interstitial spaces within limestone rock rubble are known to support a characteristic mollusc fauna of selected shade-loving species (Evans and Jones 1973). These faunas are rich in species like Oxychilus, Vitrea and Discus, which can inhabit environments devoid of vegetation. Of these only Vitrea was particularly important here and its higher proportional importance at the base of the ditch may indicate a greater rock rubble component at that level. Furthermore, Carychium, Retinella (called Aegopinella spp. and Nesovitrea hammonis here after Walden 1976), which are normally rare in rock rubble habitats, are abundant here. Evidently we are not dealing with a typical rock rubble fauna.

A recent study by Cameron and Morgan-Huws (1975) has demonstrated that tall ungrazed grassland has a mollusc fauna which is similar in some respects to woodland. Three species, normally considered as shade-loving, are particularly characteristic of tall grassland - these are Carychium tridentatum, Vitrea contracta and Aegopinella pura and it is interesting that these are the most abundant species in the lower fill of the ditch. Notwithstanding this there are persuasive grounds for arguing that there was a fair amount of woodland in the area. The sediments show that conditions were far from stable, they probably accumulated fairly rapidly yet there were a great many molluscs and the fauna is such a rich one in terms of the range of species. Also Discus rotundatus is present and, though it is not as important as in many woodland faunas, it does seem to be absent from purely tall grassland faunas as do Oxychilus, Acanthinula aculeata, Aegopinella nitidula and the Clausiliidae which are all present here.

We do seem to be dealing with an environment where there was a fair amount of shade. These conditions were probably created to some extent by tall grassland but almost certainly there was a good deal of tree cover remaining. The exact extent of open conditions is difficult to assess because of problems created by the ditch microenvironment. There is, however, rather less evidence for clearance and exposed conditions than one would expect in view of the known fact of the monument's construction. The large proportion of Carychium tridentatum may be explained by its predeliction for leaf litter which could have accumulated in quantity in the partly infilled ditch. An interesting point in this regard is that Carychium tends to favour undisturbed conditions but here it reaches a peak in the layer containing occupation refuse between 180 and 190cm. This may be partly because of more stable conditions but it may also suggest only small scale disturbance at this time.

A fairly abrupt ecological change occurs at the base of the earthworm sorted horizon at c.140cm, which produced sherds of Romano-British pottery. Thereafter the number of molluscs is very much smaller and the shade-loving species are only present as isolated individuals. The fauna consists largely of the Limacidae and open country species like Vallonia excentrica, Vallonia costata and Helicella itala. This grouping of species has been found by the writer, (unpublished data) on the Chalk, to be typical of dry, colluvial, ploughwash deposits but there they are generally associated with high values for Trichia hispida which is poorly represented here. Also present are small proportions of Vertigo pygmaea and Pupilla muscorum pointing to the existence of areas, or episodes, of more stable conditions. Both species might be expected to have predominated in the stabilization horizon between 120 and 140cm, whereas there is no detectable ecological change between this and the overlying, largely unsorted, sediments. The explanation may be that the stabilization episode was of some duration and that decalcification of the soil horizon occurred with the result that the associated mollusc fauna is not preserved. This would also help to explain the rather abrupt nature of the ecological change at this level.

The characteristics of the upper ditch sediments, their unsorted nature, the high proportion of limestone pieces, the impoverished nature of the fauna and the species present, all suggest this may be a typical tertiary ditch fill (Limbrey 1975, p.299), formed under arable agriculture. Arable conditions are also suggested by the large number of examples of Cecilioides acicula above 150cm. as this species tends to restrict its burrowing activities to arable areas. Between 80 and 100cm there were non-apical fragments of Candidula intersecta and Candidula virgata, both Medieval introductions (Kerney 1966) which imply that these sediments built up during, or since, that period.

Charcoal was extracted from the sediments during the course of mollusc analysis and the grams per kilogram of soil are represented diagramatically in Figure 2. This shows two layers of charcoal concentration. The lower at 170-190cm is the horizon dated 1770 $\pm$ 80 bc; it does not accompany any ecological change and can be interpreted as charcoal of domestic origin since it was accompanied by pottery, etc. The upper, more pronounced, band of charcoal at 140-150cm corresponds to a changeover from shady, probably open woodland, conditions to a much more open environment. We can probably correlate this with an episode of clearance by burning which occurred some time after the life of the henge and probably, though not certainly, before the Romano-British period.

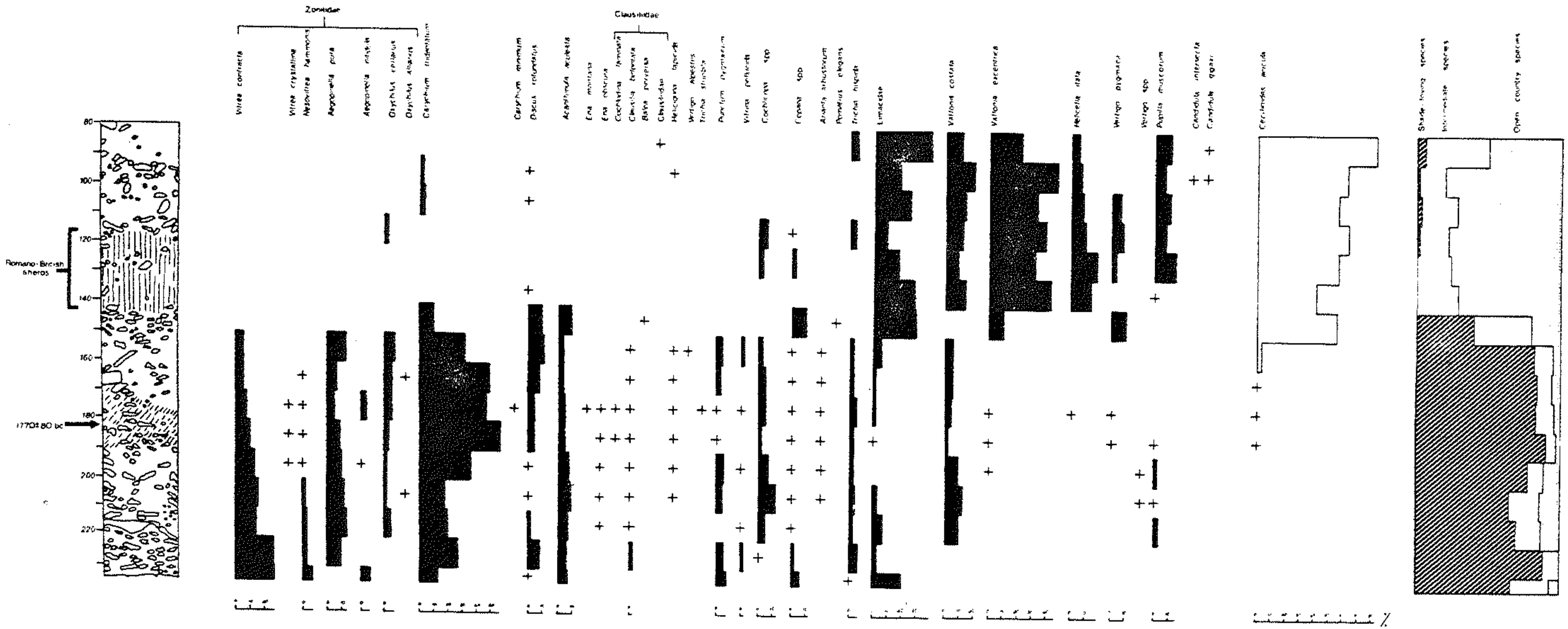
Also present in the mollusc samples was a small amount of vertebrate faunal material which has kindly been identified by Bruce Levitan B.Sc. The samples below 140cm, associated with a woodland mollusc fauna, contained bones of wood mouse (Apodemus sylvaticus) and bank vole (Clethrionomys glareolus) which are today normally associated with fairly dense vegetation cover, either woodland or overgrown hedgebanks. Also present was the field vole (Microtus agrestris) which prefers open conditions but is fairly adaptable to different habitats (Lawrence and Brown 1967, p.78) and is found in open woodland. The only other bones were phalanges from a small dog at 160-170cm and an unidentified bird bone at 170-180cm. No identifiable bones were found in the Romano-British and later sediments above 140cm.

Excavations within the henge revealed a number of features, or pockets, in the Oolite, filled with reddish brown (5 YR 4/4) clay and largely devoid of calcareous material. In one of these, feature 3, there were black specks which under magnification are clearly charcoal, though not of sufficient size for identification. There was no other artifactual material in the features and they were tentatively interpreted as of natural origin. The clayey, non-calcareous fill suggests they may be solution features although it is possible that the pockets were originally created by tree root action and subsequently decalcified. Limbrey (1975, p.190) has hypothesised, on other sites on the chalk and limestone, that sols lessivés formed following woodland clearance. It may be that these clay filled features represent truncated illuvial horizons and that the charcoal in feature 3 derives from clearance.

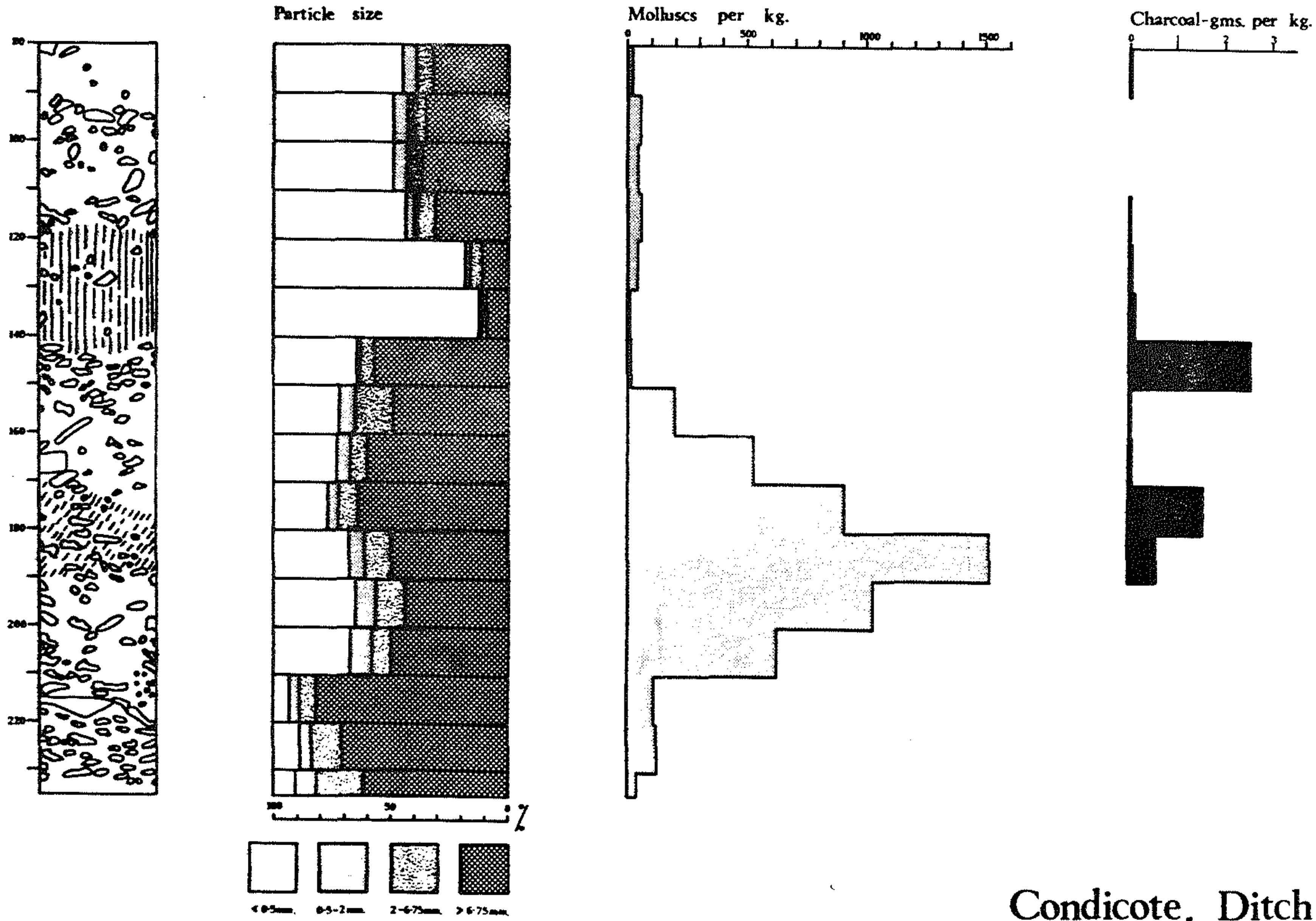
Conclusions

There does seem to be fairly convincing evidence of a good deal of shade, created almost certainly by open woodland conditions and tall grass, surviving for some time after the monument's construction. It is encouraging to find this conclusion gaining some small measure of support from the distribution of charcoal and the small mammal fauna. No information is available on the pre-henge environment so there is no way of knowing whether we are dealing with primary woodland or secondary colonisation. However, it can hardly represent colonisation subsequent to the monument's construction since there is no evidence of a greater number of open country species towards the base of the ditch. It looks very much therefore as if the monument, or at least this inner ditch, was constructed in an environment which was not fully cleared until much later. This conclusion is a surprising one in the light of palaeoenvironmental investigations of other Neolithic monuments. The only published Neolithic palaeoenvironmental work on the Cotswolds concerns the long barrow at Ascott-under-Wychwood which, following an interesting sequence of woodland and more open phases, was finally constructed in open country (Evans, 1971). Mollusc studies of the major henge monuments on, or just off, the chalk at Durrington Walls (Evans, 1971b), Avebury

(Evans 1972, p.268), Marden (Lower Greensand with calareous drift - Evans 1971c), Stonehenge (Evans 1978), Woodhenge and Mount Pleasant (Evans and Jones 1979), indicate that all of these areas were cleared some time before the monument's construction, although at Mount Pleasant there is some evidence for a phase of woodland regeneration within the ditch sediments. Pollen analysis at one of the Priddy henges on Mendip also showed that the area was cleared and under grass at the time of construction (Dimbleby 1967). On several of the chalk sites original clearance can probably be correlated with evidence for pre-henge occupation in the early or middle Neolithic periods for which no evidence has so far been found at Condicote. The apparent contrast between the ecological setting of Condicote and the chalkland henges should not perhaps occasion any great surprise because henges are a fairly heterogeneous grouping including a variety of sub-types (Wainwright 1969), and quite possibly these had a variety of functions and ecological settings.



Condicote Henge Ditch



Condicote, Ditch

	80-90 cm.	90-100 cm.	100-110 cm.	110-120 cm.	120-130 cm.	130-140 cm.	140-150 cm.	150-160 cm.	160-170 cm.	170-180 cm.	180-190 cm.	190-200 cm.	200-210 cm.	210-220 cm.	220-230 cm.	230-235 cm.			Buried soil
Pomatias elegans (Müller)							+												
Carychium minimum Müller										2									
Carychium tridentatum (Risso)		1	1				1	45	183	430	592	147	56	18	17	2			
Cochlicopa lubrica (Müller)								4		1	4	4	7						
Cochlicopa lubricella (Porro)										10	1								
Cochlicopa spp.				3	1				17	35	17	23	32	5	+				+
Vertigo pygmaea (Draparnaud)			2	4	1		1			1	2	1				1			
Vertigo alpestris Alder								17											
Vertigo spp.												1	2						
Pupilla muscorum (Linné)	2	3	4	4	5	+					3	7	3	3					1
Vallonia costata (Müller)	2	9	5	6	3	1		7	20	37	25	35	38	9					1
Vallonia excentrica Sterki	4	21	12	19	11	3	1			3	2	2							+
Acanthinula aculeata (Müller)							1	5	15	46	55	33	27	6	4	1			
Ena montana (Draparnaud)										1									
Ena obscura Müller										6	8	3	2	1					
Punctum pygmaeum (Draparnaud)								6	11	11	11	21	15		3	1			
Discus rotundatus (Müller)		+	+			+	1	16	29	33	39	4	2	2	5	+			
Vitrina pellucida (Müller)								3		1		1		1	1				
Vitrea crystallina (Müller)										12	3	2							
Vitrea contracta (Westerlund)								9	23	73	103	57	51	14	17	4			
Nesovitrea hammonis (Ström)									1	1	2	1	6	3	2	1			
Aegopinella pura (Alder)								18	26	49	93	43	38	13	6				
Aegopinella nitidula (Draparnaud)										30		2				1			
Oxychilus cellarius (Müller)				1				11	20	47	36	7	6	5					
Oxychilus alliarius (Müller)									1				1						
LIMACIDAE	7	8	9	5	6	2	3	9	7	16	13		9	6	2	3			10
Cecilioides acicula (Müller)	84	73	46	85	44	10	12	4	4	3	1								43
Cochlodina laminata (Montagu)										1	4								
Clausilia bidentata (Ström)								2	3	8	7	1	2	1	1				
Balea perversa (Linné)							1												
CLAUSILIIDAE	1																		
Candidula intersecta (Poiret)		+																	
Candidula gigaxii (L. Pfeiffer)	+	+																	1
Helicella itala (Linné)	1	3	3	5	6	1				1									1
Trichia striolata (C. Pfeiffer)										2									
Trichia hispida (Linné)	1			2				4	13	49	36	11	11	3	4	+			+
Arianta arbustorum (Linné)								+	+	+	1	1	1						
Helicigona lapicida (Linné)		+						+	+	+	1	+	1						
Cepaea nemoralis (Linné)											1	+	+	+	+				
Cepaea hortensis (Müller)										+									
Cepaea spp.				+	1		1	2	1	5	3	4	4	1	1	1			
Total [minus C. acicula]	18	45	36	49	34	7	10	142	370	911	1062	411	316	91	63	15			14

References

Cameron, R.A.D. and Morgan-Huws, D.I., (1975) : 'Snail faunas in the early stages of a chalk grassland succession'. Biological Journal of the Linnean Society, Vol.7, No.3, pp.215-229.

Dimbleby, G.W. (1967) : 'Pollen analysis' in Tratman E.K., 'The Priddy circles, Mendip, Somerset. Henge Monuments'. Proceedings of the University of Bristol Spelaeological Society, Vol.11:2, pp.97-125.

Evans, J.G. (1971) : 'Habitat change on the calcareous soils of Britain: the impact of Neolithic man' in Simpson D.D.A. (ed.), Economy and Settlement in Neolithic and early Bronze Age Britain and Europe, (Leicester Univ.Press), pp.31-41.

Evans, J.G. (1971b) 'Durrington Walls: the pre-henge environment' in Wainwright, G.J. and Longworth, I.H., Durrington Walls: excavations 1966-8, pp.329-337.

Evans, J.G. (1971c) : 'The pre-enclosure environment' in Wainwright, G.J. et al., 'The excavation of a late Neolithic enclosure at Marden, Wilts', Antiquaries Journal, Vol.51, pp.177-239.

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

Evans, J.G. (1978) : 'Stonehenge:Ancient environments', The Times, Wednesday, 23 August, 1978.

Evans, J.G. and Jones, H. (1973) : 'Subfossil and modern land-snail faunas from rock-rubble habitats', Journal of Conchology, 28, pp.103-129.

Evans, J.G. and Jones, H. (1979) : 'Mount Pleasant and Woodhenge: the land Mollusca' in Wainwright, G.J. Mount Pleasant, Dorset: Excavations 1970-71, pp.190-213.

Kerney, M.P. (1966) : 'Snails and man in Britain', Journal of Conchology, 26, pp.3-14.

Kerney, M.P. and Cameron, R.A.D., (1979) : Field guide to the land snails of Britain and North-west Europe, (Collins).

Lawrence, M.J. and Brown, R.W. (1967) : Mammals of Britain: their tracks, trails and signs, (Blandford).

Limbrey, S. (1975) : Soil science and Archaeology, (Academic Press).

Wainwright, G.J. (1969) : 'A review of henge monuments in the light of recent research', Proceedings of the Prehistoric Society, 35, pp.112-33.

Waldén, H.W. (1976) : 'A nomenclatural list of the land Mollusca of the British Isles', Journal of Conchology, 29, pp.21-25.