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Ancient Monuments Laboratory
Report 75/87

THE MOLLUSCA FROM THE 1964 EXCAVATIONS AT ROUGHRIDGE HILL, BISHOPS CANNINGS, WILTSHIRE: ROUND BARROWS GRINSELL 61, 62, AND 62a.

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Summary

Molluscan assemblages from contexts from three round barrows at Roughridge Hill, Wiltshire, are described. They come from a chronological range of contexts that begins in the Neolithic and ends at the present day. The composition of the assemblages and their structure indicate the following environmental sequence. Woodland and scrub vegetation covered at least parts of the immediate vicinity during the Neolithic. Water molluscs and ostracods indicate an origin in freshwater streams for some of the pit material. There was open country in the Bronze Age. Immediately prior to the construction of the barrows the environment was of stable well-established grassland, not too heavily grazed. The ditch assemblages show that woodland and scrub refugia were not far away during at least one part of the post-barrow period. Comparison with the present-day fauna on the Wansdyke shows that the prehistoric vegetation was substantially richer in shrubs and trees.

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The Mollusca from the 1964 excavations at Roughridge Hill, Bishops Cannings, Wiltshire: round barrows Grinsell 61, 62 and 62a.

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With a note on the small vertebrates.

By T. O'Connor, Environmental Archaeology Unit, Department of Biology, University of York, York YO1 5DD. Phone: 0904-430000 ex. 5531/5849.

Abstract. Molluscan assemblages from contexts from three round barrows at Roughridge Hill, Wiltshire, are described. They come from a chronological range of contexts that begins in the Neolithic and ends at the present day. The composition of the assemblages and their structure indicate the following environmental sequence. Woodland and scrub vegetation covered at least parts of the immediate vicinity during the Neolithic. Water molluscs and ostracods indicate an origin in freshwater streams for some of the pit material. There was open country in the Bronze Age. Immediately prior to the construction of the barrows the environment was of stable well-established grassland, not too heavily grazed. The ditch assemblages show that woodland and scrub refugia were not far away during at least one part of the post-barrow period. Comparison with the present-day fauna on the Wansdyke shows that the prehistoric vegetation was substantially richer in shrubs and trees.

The barrows are situated at NGR: SU 060660. They are Grinsell 61 = A, 62 = B and 62a = C in order of excavation.

The Mollusca came from four collections:

(1) 15 lots of snail shells hand-selected during excavation.
(2) 19 soil samples collected during excavation.
Both (1) and (2) were collected by Edwina Proudfoot in 1964 and submitted by H.B.M.C.E. to J.G. Evans for analysis in 1986.
(3) 8 soil samples collected and analysed by J.G.E. in 1964, and published in Evans (1972). The lists are included here as a few changes have been made and the nomenclature updated.
(4) A modern turf from the bank of the adjacent Wansdyke collected by J.G.E. in February 1987.

The collections are listed and dealt with in this order. Within each collection the samples are arranged first by site and then, as far as is possible, in chronological order from the latest to the earliest and dealt with accordingly.

(1) Shells hand-selected during excavation. The 15 collections are biassed towards the larger species, Cepaea spp. and Arianta, and to a lesser extent Helicella itala, Trichia hispida and Pomatias elegans. Practically all shells of other species in the lists were washed out of earth associated with these larger shells. The basic data is presented in Table 1.

The preservation of the Cepaea shells was so good that they could be scored for background colour and banding. This data is presented in Table 2. Scoring for colour must be considered as approximate only, but it did seem possible in the case of Cepaea nemoralis to divide most shells into either pink/brown or yellow/white, especially where large collections made comparison easy. (See Cain 1971 for a comparable study of the Avebury area, in particular the shells from the South Street long barrow.) All the Cepaea nemoralis are pink-lipped, and all but one are unbanded. The single exception (from 522) also differs from the rest in being stained with manganese oxide and is probably a younger, intrusive, shell.

Contexts and lab. nos. for the shells hand-selected during excavation:

No.	Site	Context	Shells
9	A	Q3/Tr2. Ditch fill, dark soil, layer 1.	9
26	A	Q3/Tr2. Ditch fill, rainwash.	6
18	A	Q1/Tr1. Ditch fill, dark soil.	8
522	A	Ditch fill.	58
379d	A	Grave. Undisturbed edge of Thurnham's pit.	1
523	A	Mound material.	96
19	A	Q1/Tr1. Grey weathered material, context unspecified.	5
360	A	Neolithic pit.	1
524	A	Q2/Tr8. Neolithic pit, north of ditch.	59
525	B	Earth mound.	24
272B	B	Q1/Tr2. Earth mound.	6
525B	B	Natural hollow beneath O.G.S.	84
494C	C	Q2/Tr13. Pit 6, bottom.	9
478/5	C	Q2/Tr13 (T11). Pit 6, grey ashy fill S. of rabbit run.	2
413B	C	Q1/Tr2. Context unspecified.	1

	413B	478/5	494C	525B	272B	525	524	360	19	523	379d	522	18	26	9
Pomatias elegans (Müller)	-	-	-	10	-	1	16	-	-	2	-	3	-	-	-
Carychium tridentatum (Risso)	-	-	1	2	-	-	-	-	-	2	-	1	1	1	-
Cochlicopa lubricella (Porro)	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-
Vertigo pygmaea (Draparnaud)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Pupilla muscorum (Linné)	-	-	1	1	-	-	-	-	-	1	-	1	-	-	1+
Vallonia costata (Müller)	1	-	-	-	2	-	-	-	2	4	-	5	1	-	1
Vallonia excentrica Sterki	-	-	-	3	-	-	1	-	-	2	-	2	-	-	1
Vallonia spp. (not V. costata)	-	-	-	3	2	1	1	-	-	1	-	2	-	-	-
Acanthinula aculeata (Müller)	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Ena montana (Draparnaud)	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Punctum pygmaeum (Draparnaud)	-	-	-	2	-	-	-	-	1	-	-	-	1	-	-
Discus rotundatus (Müller)	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-
Vitrina pellucida (Müller)	-	-	-	-	-	1	-	-	-	2	-	-	2	-	-
Vitrea crystallina (Müller)	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-
Aegopinella pura (Alder)	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Aegopinella nitidula (Draparnaud)	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-
Oxychilus cellarius (Müller)	-	-	-	1	-	-	2	-	-	1	-	-	-	-	-
Limacidae	-	-	1	-	2	-	-	-	-	2	-	-	-	1	-
Clausilia bidentata (Ström)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Candidula gigaxii (Pfeiffer)	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-
Cernuella virgata (da Costa)	-	-	-	-	-	-	-	-	-	4*	-	3‡	-	-	-
Helicella itala (Linné)	-	2	1	5	-	2	4	-	1	29	-	13	-	1	1
Trichia hispida (Linné)	-	-	2	5	-	1	3	-	-	14	-	9	1	1	1
Arianta arbustorum (Linné)	-	-	-	3	-	3	1	-	-	1	-	-	-	-	-
Helicigona lapicida (Linné)	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-
Cepaea nemoralis (Linné)	-	-	1	25	-	12	15	-	-	17	-	13	2	2	3
Cepaea hortensis (Müller)	-	-	-	6	-	1	5	1	1	2	-	1	-	-	-
Cepaea spp.	-	-	-	15	-	1	5	-	-	6	-	4	-	-	1

Table 1. Roughridge Hill. Snails hand-selected during excavation. + = var. triplicata; ‡ = fresh periostracum, recent shells.

Sample	Species	Colour and banding formula	No. of shells
9	Cepaea nemoralis	pink/brown, unbanded	2
		yellow, unbanded	1
	Cepaea spp.	unbanded	1
26	Cepaea nemoralis	brown, unbanded	1
		white, unbanded	1
18	Cepaea nemoralis	pink/brown, unbanded	1
		yellow, unbanded	1
522	Cepaea nemoralis	pink/brown, unbanded	2
		yellow, unbanded	10
		yellow, mid-banded	1+
	Cepaea hortensis	yellow, 5-banded	1
	Cepaea spp.	unbanded	4
523	Cepaea nemoralis	pink/brown, unbanded	8
		yellow/white, unbanded	9
	Cepaea hortensis	5-banded	2
	Cepaea spp.	unscorable	6
19	Cepaea hortensis	5-banded	1
360	Cepaea hortensis	unbanded	fragment‡
524	Cepaea nemoralis	pink/brown, unbanded	7
		yellow/white, unbanded	8
	Cepaea hortensis	5-banded	5
	Cepaea spp.	unscorable	5
525	Cepaea nemoralis	yellow/white, unbanded	12
	Cepaea hortensis	white, 5-banded	1
	Cepaea spp.	white, 5-banded	1
525B	Cepaea nemoralis	pink/brown, unbanded	11
		yellow/white, unbanded	13
		faint blotchy banding	1
	Cepaea hortensis	5-banded	4
		(12)(345)	1
		1(23)45 (1 thick, 4 thin)	1
	Cepaea spp.	unscorable	15
494C	Cepaea nemoralis	white, unbanded	1

Table 2. Roughridge Hill. Cepaea banding and colour scores. + = manganese oxide stained, probably younger than the main collection. ‡ = just possibly Cepaea nemoralis.

(2) Soil samples collected during excavation by Edwina Proudfoot

These were weighed (air-dry) and sieved through a nest of 3 sieves - 2mm, 1mm and 0.5mm. The complete shells and all fragments with apex were picked out and identified (Table 5). The weights of the residues in the three sieves were recorded (Table 3). Qualitative estimates of charcoal, cremated bone and other interesting inclusions such as daub were made, and much of this material was extracted (see list of sample contexts and descriptions). The charcoal (and a small quantity of cremated bone) was sent to Alan Clapham at the Institute of Archaeology, London University. The small vertebrate bones and teeth were extracted and have been identified by Terry O'Connor (Table 8). Ostracods from one sample (156) were identified by Judith Atkinson, Department of Archaeology, University College Cardiff.

Soil samples collected by Edwina Proudfoot and analysed by J.G.E. in 1987. Descriptions of E.P. underlined. Following descriptions and comments by J.G.E.

No.	Site	Context and description
379B	A	Q2/T5. Thurnham's pit, undisturbed S. edge of grave. Abundant charcoal and cremated bone.
377A	A	Q2/T5. Thurnham's pit, undisturbed S. edge of grave. Abundant charcoal and cremated bone.
176A	A	Q2/T5. Thurnham's pit, undisturbed edge of grave. Abundant coarse chalk. Charcoal common. A small quantity of cremated bone.
295	A	Q3/T13. Soil from mound next to 294. Dark greyish brown (10YR 4/2) very chalky silty clay loam.
294	A	Q3/T13. Soil from mound next to 295. Very dark greyish brown (10YR 3/2) chalky silty clay loam; numerous chalk fragments.
518	A	Q2/T8. 8' from NE. 10' peg, depth 11". Fine "ashy" chalky soil in central area specifically around Thurnham's pit. Dark greyish brown (10YR 4/2) chalky silty clay loam. Large fragments mostly chalk, occasional flint.
458B	A	Q2/T7. Neolithic pit. Chalky rainwash material at S. end. Very dark greyish brown (10YR 3/2) chalky material. "Grey" and powdery. Charcoal common, some bone.
284	A	Q2/T7. Neolithic pit. ? Ash sample adjacent to chalk weathering. Dark greyish brown (10YR 4/2) chalky loam. Charcoal abundant, some burnt flint, one flint bladelet. Not ash.
204	A	Q2/T8. Neolithic pit, bottom. Sample associated with 203. Black (10YR 2/1) chalky clay loam. Small quantity of charcoal.

No.	Site	Context and description
203B	A	Q2/T8. Neolithic pit, dark soil at bottom, with sherd 203A. Black (10YR 2/1) silty clay loam, practically no chalk; small quantity of charcoal.
192B	A	Q2/T8. Neolithic pit, charcoal and soil. Large fragments mainly chalk, occasional burnt flint. Abundant charcoal, including cereal grain. Unburnt and burnt bone.
156	A	Q2/T8. Neolithic pit, centre at depth 2' 3". Yellow flecked soil, burnt chalk?/sludge. Greyish brown (10YR 5/2) chalky clay loam, with lumps of paler daub. More clayey than any of the other samples. Some burnt flint and unburnt bone.
143	A	Q2/T8. Neolithic pit N. of ditch, depth 2' 6". Soil below large sherds near edge of pit. Very dark greyish brown (10YR 3/2-2/1) very chalky friable silty clay loam. Coarse fragments practically all chalk. Abundant charcoal, including cereal grain.
142	A	Q2/T8. Neolithic pit N. of ditch, depth 2' 6" near edge of pit. Soil adhering to inside of large black sherds; charcoal and burnt bone. Black (10YR 2/1) chalky silty clay loam; chalk and charcoal abundant, some burnt flint.
380	B	Q4/T12. Pit 10/11. Soil associated with cremated bone and flint. Black (10YR 2/1) silty clay loam, very hard and granular. Large quantity of chalk, some flint. Burnt bone and charcoal abundant. Crumbs of pottery, one small flint flake.
388	B	Q4/T12. Pit 10/11. Soil with some cremated bone from in pot and round bottom of pit. Black (10YR 2/1) chalky silty clay loam; very granular and hard, breaking down with difficulty in H_2O_2. Cremated bone and charcoal abundant.
408B2	B	Q4/T12/13. Charcoal and soil from ?pyre on O.G.S. Black (10YR 2/1) crumby soil; chalk fragments abundant. Charcoal very abundant.
500	C	Q2/T13. Pit 6. Soil at bottom of pit. Very dark greyish brown (10YR 3/2) friable chalky silty clay loam; large quantities of chalk fragments, a few small flints, some burnt. Not ashy, but charcoal abundant.
497B	C	Q2/T13. Pit 6. Soil from cremation on bottom of pit, plus charcoal. Very dark greyish brown (10YR 3/2-2/1) very chalky silty clay loam. Charcoal abundant; a small quantity of cremated bone.

Sample	Air-dry weight	> 2mm	>1-2mm	>0.5-1mm	Shells
379B	134.0	20.1	7.5	4.0	41
377A	241.0	71.1	9.7	8.6	43
176A	126.8	60.0	4.2	2.6	18
295	253.6	111.6	3.2	1.6	136
294	245.2	83.0	3.6	2.6	192
518	395.4	97.1	5.0	4.7	793
458B	81.0	21.5	4.4	0.9	6
284	248.0	39.2	3.6	1.5	35
204	148.0	14.8	1.4	1.0	7
203B	116.5	8.3	2.8	0.8	14
192B	162.0	28.2	1.2	1.5	30
156	250.7	49.0	10.3	10.8	65
143	356.5	95.7	9.7	4.0	44
142	210.1	67.0	3.0	1.7	10
380	586.2	190.7	8.7	0.6	15
388	830.0	133.5	17.1	7.7	95
408B2	244.6	11.2	1.9	1.3	310
500	679.2	123.8	18.4	7.0	114
497B	816.0	130.6	21.1	10.2	203

Table 3. Roughridge Hill. Soil samples collected during excavation by Edwina Proudfoot. Weight data (g) and shell totals.

The above data can be used to assess the numbers of shells per unit weight of sample (less the residues) and per unit weight of the various residue size fractions. This is done in Table 4, with the shell numbers being presented as percentages. Information of this sort is useful when sample weights vary considerably (as here) and when the stone content also varies.

Further correlations have not been made but could be done if the excavator wishes. For example, it would be possible to correlate shell totals and residue weights, and from this to say something about the processes involved in the soil/sediment formation.

Sample	Air-dry weight less residue weight	Shells per air-dry weight less residue	Shells per residues	
			>2mm	<2-0.5mm
379B	102.4	40.0	204.0	356.5
377A	151.6	28.4	60.0	224.0
176A	60.0	30.0	30.0	264.7
295	137.2	99.1	121.9	2833.3
294	156	123.1	231.3	3096.8
518	288.6	274.8	816.7	8175.2
458B	54.2	11.1	27.9	113.2
284	203.7	17.2	89.3	686.3
204	130.8	5.4	47.3	291.7
203B	104.6	13.4	168.7	388.9
192B	131.1	22.9	106.4	1111.1
156	180.6	36.0	132.7	308.1
143	247.1	17.8	46.0	321.2
142	138.4	7.2	14.9	212.8
380	386.2	3.9	7.9	161.3
388	671.7	14.1	71.2	383.1
408B2	230.2	134.7	2767.9	9687.5
500	530	21.5	92.1	448.8
497B	654.1	31.0	155.4	648.6

Table 4. Roughridge Hill. Soil samples collected during excavation by E.P. Weight data adjusted for coarse residues (>0.5mm) and shell numbers as a percentage of the adjusted weights and residues. Note that all the data in this table can be obtained from Table 3.

	497B	500	408 B2+	388	380	142	143	156‡	192B	203B	204	284	458B	518*	294	295	176A	377A	379A
Pomatias elegans (Müller)	1	1	2	-	-	1	1	4	1	1	-	2	-	4	3	3	-	-	-
Carychium tridentatum (Risso)	5	15	1	-	-	1	4	3	2	-	-	7	1	-	2	1	-	-	-
Succineidae	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Cochlicopa lubrica (Müller)	3	-	-	-	1	-	-	-	-	-	-	-	-	-	?1	?1	1	-	-
Cochlicopa lubricella (Porro)	1	-	-	-	1	-	-	-	-	-	-	-	-	14	-	1	-	-	-
Cochlicopa spp.	7	2	6	6	1	-	3	2	-	-	2	1	-	10	3	7	1	4	4
Vertigo pygmaea (Draparnaud)	2	-	17	2	-	-	1	-	1	-	-	-	-	34	2	4	1	1	1
Pupilla muscorum (Linné)	15	-	2	16	2	-	2	2	4	3	1	3	1	76	16	10	-	2	3
Vallonia costata (Müller)	44	8	109	13	-	1	7	6	3	2	-	3	2	221	56	34	2	11	7
Vallonia pulchella (Müller)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	?1	-	-	-
Vallonia excentrica Sterki	16	1	38	9	1	-	1	-	1	-	-	2	-	141	16	12	1	4	2
Vallonia spp. (not V. costata)	56	-	95	18	4	-	1	2	4	3	1	4	-	173	47	27	10	11	15
Acanthinula aculeata (Müller)	-	1	2	-	-	-	2	-	1	-	1	-	-	1	-	-	-	-	-
Ena montana (Draparnaud)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Punctum pygmaeum (Draparnaud)	-	-	1	-	-	-	-	-	-	-	-	-	-	14	-	1	-	-	-
Discus rotundatus (Müller)	-	17	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Vitrina pellucida (Müller)	5	1	-	-	-	-	-	1	-	-	-	-	1	4	3	2	-	-	1
Vitrea crystallina (Müller)	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Vitrea contracta (Westerlund)	1	6	-	-	-	-	1	1	1	-	-	2	-	-	-	1	-	-	-
Nesovitrea hammonis (Ström)	2	-	3	-	-	-	-	-	-	-	-	-	-	1	2	1	-	-	-
Aegopinella pura (Alder)	1	3	1	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-
Aegopinella nitidula (Draparnaud)	-	3	-	-	-	-	2	3	2	-	-	-	-	-	-	1	-	-	-
Oxychilus cellarius (Müller)	2	17	-	-	-	1	-	1	-	-	-	-	-	-	-	1	-	-	-
Oxychilus alliarius (Miller)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Limacidae	10	8	6	4	-	4	7	13	5	1	2	1	-	11	14	5	-	-	1
Eucomulus fulvus (Müller) agg.	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Cochlodina laminata (Montagu)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Clausilia bidentata (Ström)	1	3	1	-	1	1	1	-	1	-	-	2	-	3	-	3	-	-	2
Balea perversa (Linné)	-	1	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	1	-
Helicella itala (Linné)	5	4	4	18	3	-	4	4	-	-	-	2	-	18	15	8	1	2	4
Trichia hispida (Linné)	25	19	18	8	1	1	5	14	2	2	-	2	1	66	9	10	1	6	1
Arianta arbustorum (Linné)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Helicigona lapicida (Linné)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cepaea spp.	-	-	-	1	-	-	1	3	1	1	-	-	-	2	-	1	-	1	-
Arianta, Cepaea spp.	1	1	1	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Pisidium casertanum (Poli)	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-

Table 5. Roughridge Hill. Snails from soil samples collected by Edwina Proudfoot and analysed by J.G.Evans. + = shells stained with dark oxide, probably manganese. ‡ = includes 2 ostracods, Candona sp. and Ilyocypris sp. * = shells encrusted with calcareous material.

(3) Soil samples collected by J.G.E. in 1964

No.	Site	Context and description	Air-dry weight (g)	Shell nos.
a v	A	Ditch fill, layer 3. Bedded chalky and flinty loam.	1000	507
a iv	A	Ditch fill, layer 4. Fine chalky soil; secondary fill.	1500	631
a iii	A	Ditch fill, layer 5. White chalk rubble and finer material; primary fill.	1500	416
a ii	A	Barrow mound, turf-stack.	1000	487
a i	A	Barrow mound, turf-stack.	1000	386
b iii	B	Barrow mound, turf-stack.	1000	449
b i	B	O.G.S. under barrow mound.	1000	596
b ii	B	O.G.S. under barrow mound.	1000	599

The results of the analysis of these samples, done in 1964, are presented in Table 6.

(4) Modern turf

A single turf, 30 x 30cm was collected in February 1987 from the S. side of the bank of Wansdyke adjacent to the barrows. This proved to be extraordinarily rich in shells. In listing these (Table 7), each species has been split up into several groups as follows:

D = dead, but not obviously subfossil.
A = alive or recently dead (i.e. in the last few months, as judged by the freshness of the periostracum).
ad. = adults.
juv. = juveniles.
Where ad. or juv. is not specified, the shells are juv. or broken. In addition, the size of the shells of Trichia species was recorded by counting the number of whorls. There were no obviously subfossil shells in the collection.

An interesting feature of the fauna was the presence of Trichia plebeia. The shells were quite distinct from associated Trichia striolata and Trichia hispida, and could be separated from them right down to the smallest apices. This is the first record of Trichia plebeia from the Avebury area.

	b ii	b i	b iii	a i	a ii	a iii	a iv	a v
Pomatias elegans (Müller)	7	5	5	14	4	12	4	3
Carychium tridentatum (Risso)	5	5	2	3	5	6	72	1
Cochlicopa lubrica (Müller)	2	5	11	16	21	-	46	21
Cochlicopa lubricella (Porro)	-	-	-	-	-	18	3	-
Cochlicopa spp.	14	10	-	-	-	-	-	-
Vertigo pygmaea (Draparnaud)	14	33	12	3	15	11	16	9
Pupilla muscorum (Linné)	21	21	13	42	57	25	6	61
Vallonia costata (Müller)	215	204	140	85	116	104	176	76
Vallonia pulchella (Müller)	-	-	?6	?3	-	-	-	-
Vallonia excentrica Sterki	221	209	185	140	174	148	49	189
Acanthinula aculeata (Müller)	1	1	8	-	1	1	-	-
Ena montana (Draparnaud)	-	-	-	1	-	1	1	-
Punctum pygmaeum (Draparnaud)	4	11	2	2	-	1	3	1
Discus rotundatus (Müller)	6	5	4	1	-	-	5	-
Vitrina pellucida (Müller)	4	4	2	2	1	6	31	3
Vitrea crystallina (Müller)	-	-	-	-	-	2	26	-
Vitrea contracta (Westerlund)	-	-	-	-	-	-	9	-
Nesovitrea hammonis (Ström)	-	2	2	2	3	1	20	-
Aegopinella pura (Alder)	1	3	-	-	1	-	15	-
Aegopinella nitidula (Draparnaud)	6	3	-	1	1	2	7	-
Oxychilus cellarius (Müller)	2	3	1	-	1	4	16	-
Limacidae	-	-	4	3	5	5	31	12
Cochlodina laminata (Montagu)	3	-	2	3	2	2	-	-
Clausilia bidentata (Ström)	4	2	2	3	3	3	5	1
Helicella itala (Linné)	21	28	23	36	42	28	33	83
Trichia hispida (Linné)	42	37	15	20	29	27	50	44
Arianta arbustorum (Linné)	-	-	1	1	-	-	+	-
Helicigona lapicida (Linné)	1	-	-	-	-	-	-	-
Cepaea nemoralis (Linné)	+	+	+	+	+	-	+	-
Cepaea hortensis (Müller)	-	-	+	+	-	-	+	-
Arianta, Cepaea spp.	4	4	7	3	5	9	4	3

Table 6. Roughridge Hill. Snails from soil samples collected by J.G.E. + = non-apical fragment.

Carychium tridentatum (Risso) 1 (A, ad.)
Cochlicopa cf. lubrica (Müller) 1 (A, juv.), 1 (D, juv.)
Cochlicopa lubricella (Porro) 1 (A, ad.), 1 (D, juv.)
Cochlicopa spp. 2 (A, juv.), 1 (D, juv.)
Vertigo pygmaea (Draparnaud) 5 (A, ad.), 12 (A, juv.), 22 (D, ad.), 14 (D, juv.)
Abida secale (Draparnaud) 1 fgt. (?) (D)
Pupilla muscorum (Linné) 2 (A, ad.), 6 (A, juv.), 5 (D, ad.), 13 (D, juv.)
Vallonia costata (Müller) 5 (A, ad.), 16 (A, juv.), 19 (D, ad.), 32 (D, juv.)
Vallonia excentrica Sterki 1 (A, ad.), 6 (A, juv.), 15 (D, ad.), 18 (D, juv.)
Punctum pygmaeum (Draparnaud) 7 (A), 13 (D)
Arion hortensis Ferussac, agg. or Arion intermedius Normand 1 (A)
Vitrina pellucida (Müller) 8 (A, ad.), 10 (D)
Vitrea contracta (Westerlund) 3 (D)
Nesovitrea hammonis (Ström) 4 (A), 4 (D)
Aegopinella nitidula (Draparnaud) 1 (A), 1 (D)
Oxychilus cellarius (Müller) 5 (A)
Limacidae 12 (D, plates)
Cecilioides acicula (Müller) 1 (D)
Candidula intersecta (Poiret) 4 (A)
Cernuella virgata (da Costa) 10 (10)
Helicella itala (Linné)+ 27 (D)
Monacha cantiana (Montagu) 2 (A)
Trichia striolata (Pfeiffer) 3 (A)

Trichia plebeia (Draparnaud)	no. of whorls (A)	shells		
	3+	6		
	2-3	45		
	<2	163		
Trichia hispida (Linné)	no. of whorls (A)	shells	no. of whorls (D)	shells
	5+	2	5+	1
	4-5	3	4-5	4
	3-4	1	3-4	19
	2-3	33*	2-3	27
	<2	11*	<2	24

Trichia spp. (very small apices, probably mostly Trichia plebeia) 21 (A)
Cepaea spp. 1 (A), 2 (D)

Table 7. Roughridge Hill. Modern fauna from the adjacent Wansdyke. + = one large adult seen on Wansdyke, not long dead, so the species is probably still living in the area. (Also occurs alive on the Avebury ring and the slopes of Knap Hill.) * = includes one colourless specimen.

No.	Identification and bone/tooth
142	Mouse or vole, rib.
	Small passerine bird, 1st phalanx pes.
143	Large *Apodemus* sp., more like *A.flavicollis* than *A. sylvaticus* in size and morphology, distal end of femur (juv.)
156	*Arvicola terrestris*, part lower incisor.
	Indet., misc. fgts.
192B	Indet., fgt.
284	? Rodent, part of ilium.
294	Indet., ?cranial fgt.
295	Vole sp., molar enamel fgt.
380	*Mus/Apodemus* sp., lower incisor fgt.
388	*Microtus agrestis*, right M_2.
	?Vole, molar fgts.
	Indet., fgts.
408B2	*Apodemus sylvaticus*, prox. end of ulna, dist. end of humerus.
	Mouse/vole sp., sacrum fgt.
	Indet., fgts.
497	Vole sp., lower incisor.
	Microtus agrestis, M_2, fgts.
	Small passerine bird, 3rd phalanx pes.
	Indet., fgts.
500	Mouse/vole sp., vertebral fgts.
	Clethrionomys glareolus, right astragalus.
	Biggish mammal, fgts.
	Bufo bufo, numerous bones and fgts., including femur, tibio-fibula, metapodials and phalanges.
518	*Arvicola terrestris*, incisor.
	Talpa europaea, 2nd phalanx manus.
	Indet., tooth fgts.

Table 8. Roughridge Hill. Small vertebrates, identified by Terry O'Connor.

The small vertebrate bones included the following species: cf. *Apodemus flavicollis* (yellow-necked mouse), *Apodemus sylvaticus* (wood mouse), *Arvicola terrestris* (water vole), *Microtus agrestis* (field vole), *Clethrionomys glareolus* (bank vole), *Talpa europaea* (mole), small passerine bird and *Bufo bufo* (toad). In spite of the small collection, the fauna was thus quite rich and well worth the effort of extraction and identification.

Discussion

The assemblages are dealt with by context chronologically, and the following broad categories can be recognised:

Natural hollow beneath O.G.S.
Pre-barrow pits (Note. It is not clear whether all the pits are indeed pre-barrow, nor whether the samples between 458B and 142 are all from the same pit.)
O.G.S. and turf-stack.
Primary grave pit in A.
Ditch infilling.
Modern turf.

Natural hollow beneath O.G.S. Only one assemblage, of hand-selected shells (525B), came from this feature. It contains a higher proportion of Pomatias elegans than any but one (524) of the other collections, and this is probably significant. Otherwise there is nothing particularly exceptional about the assemblage. It includes a small number of woodland and open-country species.

Pre-barrow pits. Pit 6, site C. The assemblages from the 2 soil samples (497B and 500) are significantly different. 497B is from an unspecified horizon, 500 is from the pit bottom. 500 contains a high proportion of woodland species and only 12% open-country species. The latter include Vallonia costata (7%), a species that does sometimes occur in woodland. Whatever the origin of this material it seems likely that there was woodland close to the site at this time. 497B is an open-country assemblage similar to most of the others from the site, with Vallonia species predominant. The striking differences between the two samples from Pit 6, site C, should be attended to by the excavator when considering the processes involved in the pit infilling.

Pre-barrow pits. Pit 10/11, site B. The small assemblage of 110 shells from the two samples from this pit (380 and 388) is of open-country type. Vallonia species are abundant, but by comparison with the assemblages from 497B, two other open-country species, Pupilla muscorum and Helicella itala are more common. This indicates shorter turf than in 497B.

Pre-barrow pits. Neolithic pit, site A. One of the hand-selected collections (524) contains a higher number of Pomatias elegans than any other sample. The assemblages from the eight soil samples (458B-142) when amalgamated (if this procedure is justified) contain 24% woodland species, 43% intermediate species, and 33% open-country species. It is thus a mixed assemblage which, taken at face value, indicates long grassland with some shrubs such as hawthorn, juniper, gorse, etc.

There is a very interesting feature of sample 156. The material included lumps of clay of a yellow ochre colour tentatively identified as daub. This kind of material is foreign to the site and was imported. The presence in the sample of two Mollusca of marsh and freshwater habitats (a succineid and Pisidium cf. casertanum respectively) and of two freshwater ostracods indicates that this material was dug from a river clay. No specific source can be proposed. (Incidentally it is likely that the two specimens of Euconulus fulvus agg. in this sample came from the same clay. Although not out of place in chalk grassland, it is more common in wetter habitats, and virtually unknown either alive or subfossil in dry habitats in the Avebury area.)

O.G.S. and turf-stack. The three samples collected by Edwina Proudfoot (518, 294 and 295)* and the five collected by J.G.E. (b ii, b i, b iii, a i and a ii) all have one striking feature in common, namely very high numbers of Vallonia, with V. costata and V. excentrica present in more or less equal abundance. Woodland species are sparse. These assemblages indicate grassland. Three other open-country species, Helicella itala, Pupilla muscorum and Vertigo pygmaea are present in variable, although generally lesser abundance, suggesting that the grassland was well established, and the sward unbroken and not particularly closely grazed. Bushes were probably virtually absent. An environment similar to that on the slopes of Knap Hill rather than that of the ranker grassland with shrubs on the adjacent Wansdyke may be proposed.

Primary grave pit, site A. The three sparse assemblages (176A, 377A and 379A) are similar to those from the O.G.S. and turf-stack in being of predominantly open-country type.

* Could also include 408 B2, ? pyre on O.G.S.

Ditch infilling and general discussion. The three assemblages from the ditch are very interesting, showing a sequence of changes not only in species composition but also in structure. By "structure" I mean the way in which the numbers of shells are distributed among the various species. The concept of "assemblage diversity" is useful in this context and it is something that can be represented in histogram form (as was done for the Roughridge Hill data in Evans 1968) and mathematically (cf. Evans and Smith 1983; Evans, Pitts and Williams 1985, for other sites in the Avebury area). Several measures of diversity have been used by ecologists with varying success and popularity. The Shannon-Wiener index (H') is applied here as defined by Pielou (1975) using natural logarithms. It incorporates two pieces of information, namely the number of species in the assemblage and the way in which the numbers of shells are distributed among the species. High values for H' indicate high species numbers and a relatively uniform distribution of shell numbers amongst the species. Total numbers are not taken into account.

It must be emphasised that the information provided by diversity indexes is additional to that of the information provided by species composition. It is not an alternative or an end in itself. Critics of the use of diversity indexes have failed to realise this point and have paid too much attention to the numerical values themselves.

In considering the Roughridge Hill ditch assemblages in this way it is useful to view them along with the earlier assemblages. The relevant diversity indexes (H') are as follows:

Pre-barrow pits	H'
500, Pit 6, site C	2.50
497B, Pit 6, site C	2.04
388+380, Pit 10/11, site B	1.97
142-458B, Neolithic pit, site B	2.68
O.G.S. and Mound	
408B2, Pyre/O.G.S., site B	1.54
518	1.74
294	1.91
295	2.26
b ii	1.75
b i	1.84
b iii	1.79

	H'
O.G.S. and Mound (contd.)	
a i	1.94
a ii	1.85
Cremation pit, 267A, 377A, 379A	1.84
Primary ditch fill, a iii	2.05
Ditch buried soil, a iv	2.53
Tertiary ditch fill, a v	1.79
Modern, alive (A)	1.51
Modern, dead (D)	2.27

It can be seen from this data and the lists in tables 1 and 5 that the assemblages from the far pre-barrow pits are rich and diverse. Woodland snails are common. This is the period of the Neolithic settlement. Later on, in the period immediately prior to the construction of the barrows, diversity falls and the open-country aspect of the assemblages becomes important. The assemblages are of consistently low diversity. With the infilling of the ditch of barrow A there are changes. In the primary fill (sample a iii) the assemblage is similar to that of the O.G.S. and turf-stack but with a slightly higher proportion of woodland species and a generally slightly higher diversity. In the ditch buried soil (a iv) the woodland species increase and there is a much higher diversity. Open-country species are still present and the woodland or scrub vegetation that is implied by this assemblage was probably confined to the ditch and its immediate surrounds. But the very presence of such a diverse assemblage shows that woodland refugia were very close. This is underlined by the difference between the buried soil assemblage (a iv), $H' = 2.53$, and the modern Wansdyke live (A) assemblage, $H' = 1.51$, representative of the situation over the last 1.5K years or so. The tertiary ditch fill (a v) shows a reversal to the situation in the Bronze Age, but with the interesting difference that Vallonia excentrica outnumbers V. costata. This is a feature of many later assemblages from the north Wiltshire downland (Ashbee, et al. 1979; Evans in Robertson-Mackay 1980) and is unexplained.

In summary, the assemblages of snails in the various contexts from the barrow cemetery on Roughridge Hill provide a fascinating, if patchy, insight into the molluscan and environmental changes from the Neolithic period to the present day.

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