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Report 98/87

A SOIL TRANSECT ASSOCIATED WITH HAZLETON NEOLITHIC LONG CAIRN, GLOUCESTERSHIRE.

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Summary

A transect of 20 auger holes and 5 soil pits was carried out across the plateau on which the cairn is located and into the adjoining dry valleys to the north and south. Modern soils are shallow to moderately deep rendzinas compared to the moderately shallow decalcified argillic brown earths beneath the cairn. What molluscs were present in the deeper dry valley sediments suggests that past cairn soil changes including erosion, although occuring over a long period of time, became particularly marked as a result of post-Medieval agriculture.

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A soil transect associated with Hazleton Neolithic long cairn, Gloucestershire

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During the excavation by Alan Saville of the Cotswold/Severn long cairn at Hazleton, Gloucestershire (1979-83) an auger transect and soil pit survey was carried out in approximately a north-south direction (Fig. 00 - location map). This ran across the plateau on which the cairn is located and down into dry valleys to south and north (Fig. 00 - transect). The aim of this transect was to provide data about modern soils for comparison with the Neolithic palaeosols and to establish whether either of the dry valleys contained sedimentary sequences relating to the Neolithic monuments or subsequent phases of landscape history.

The geology comprises the Hampen Marley Beds of the Great Oolite Series, Jurassic (see Worssam N.D.). The buried Neolithic soils are described in detail elsewhere (Macphail, 1985). Suffice it to say these were moderately shallow (25-40 cm) decalcified argillic brown earths with a silty-clay to clay texture, providing examples of the Tetbury Series (Fine loamy over clay over lithoskeletal limestone) and Ston Easton Series (Fine silty over clay over lithoskeletal limestone) (Clayden and Hollis, 1984).

The transect (Fig. 00) consisted of 20 auger holes and 5 soil pits; pit B was on the plateau supplementing data from the excavation itself, pits C and E were on the shoulders and pits A and D were in the dry valleys. Soil depth is shown schematically by a solid black bar of appropriate length and is given numerically above each bar. Profile descriptions of the soil pits are given in Appendix 2.

Soils on the transect were mainly shallow (5-10 cm on the upper slopes) to moderately deep (20-40 cm on the gently sloping plateau areas) clayey brown rendzinas (Sherbourne Series, Courtney and Findlay, 1978), with

deeper clayey brown calcareous earths with limestone rubble (Didmarton Series) on colluvial slopes and dry valley fills (Pits A and D). These soils comprise the Sherbourne Association (Findlay et al., 1983).

In Pit A there was c. 145 cm of colluvium containing oolite fragments with evidence of charcoal flecks at the base. This overlay a stoneless, probably decalcified, palaeosol with evidence of translocated clay at its base developed on oolitic limestone head. It Pit D there was a deep lower sequum of marl and limestone with only relatively deep (c. 83 cm) colluvial brown deposits in the upper sequum. The lowest brown soil horizon at 67-83 cm (B(g)2), is not decalcified and has a microfabric which in contrast to the Neolithic soils has a few limestone fragments, a brown colour and moderately high organic content. It includes only rare rounded (transported) reddish brown pedorelics of soils comparable to the Neolithic cover. It also differs by having a much more strongly enhanced magnetic susceptibility (Allen and Macphail, in press). It is thus considered to be a result of 'ploughwash' of probably much later date than the Neolithic. In fact the colluvium to 83 cm in this pit and to 145 cm in Pit A seems to be associated with the erosion of rendzinas and brown calcareous soils of the Sherbourne Association. These soils were produced after the erosion of the argillic brown earths, now only present under the long cairn and possibly below 145 cm in Pit A.

Four samples were taken from Pit A for mollusc analysis as shown on the section (Fig. 00). Only one mollusc was found and there were no artifacts to help date the colluvial deposits. Seven mollusc samples were taken from Pit D (Fig. 00) and four have been analysed. The numbers of molluscs (Appendix 1) were insufficient for meaningful interpretation except in so far as all the species are normally found in open habitats and they also show that the Medieval or later introduction Candidula intersecta is present down to c. 75 cm. Thus the Mollusca confirm the soil evidence in

suggesting that the colluvium in Pit D is late, probably Post-Medieval. In fact it lies on the uphill side of a Cotswold stone wall which has an associated lynchet.

It is possible that earlier colluvial deposits have been removed by stream action. There are small springs in both valleys and the removal of early soils and sediments has been demonstrated in some chalkland valleys (Bell, 1983a). On the other hand it may be that the post cairn soil changes, though occurring over a long period of time, became particularly marked as a result of Post-Medieval agriculture. Certainly the absence of artifacts of all periods in the colluvium and the paucity of post-Neolithic artifacts on the cairn site itself argues against much intensive land-use such as arable activity in post-Neolithic times. However a scatter of Romano-British pottery may relate to the manuring of arable in this period. With this possible exception it may be that following clearance of the secondary woodland represented by Mollusca in the cairn quarry ditches (Bell, 1983b) the area was open pasture for much of the time until enclosure and Post-Medievel agriculture.

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Appendix 1

Hazleton Soil Pit D Mollusca

	24-30 cm	40-50 cm	70-75 cm	81-90 cm
	1223 g	1661 g	1304 g	1099 g
Cochlicopa spp.				1
Pupilla muscorum (Linnaeus)			1	
Vallonia costata (Müller)		1		
Vallonia excentrica Sterki	1	4		
Vitrina pellucida (Müller)	1			
Limacidae	6	8	1	
Cecilioides acicula (Müller)		(3)		
Candidula intersecta (Poiret)	9	10	+	
Helicella itala (Linnaeus)	+	2		1
Trichia hispida (Linnaeus)		5		1
Cepaea/Arienta				+
Lymnaea truncatula	1	1		
	18	31	2	3

Appendix 2: Profile descriptions

Pit A (described by M. Bell) Plate I

Location: 07421920 Altitude: 242 m

Parent material: ? Oolitic Limestone Head

Relief: dry valley floor c. 300 m north of cairn

Soil: Didmarton Series

depth cm.

pasture cover.

0-19 Dark yellowish brown (10YR 3/4) silty clay with few small and very small oolite pieces, coarse granular peds at surface with medium subangular blocky peds below; common very fine roots; abrupt wavy boundary.

19-54 Brown (7.5YR 4/4) silty clay with many medium and small oolite pieces; angular blocky structure; few very fine roots; burnt oolite and fired clay near the surface of this layer (? marling); clear smooth boundary.

54-77 Yellowish red (5YR 4/8) silty clay with abundant small and medium oolite pieces many of them tabular, angular blocky structure; very few very fine roots; gradual smooth boundary.

77-118 Yellowish red (5YR 4/8) silty clay with abundant small and medium oolite pieces; angular blocky structure; very few very fine roots; clear wavy boundary.

118-145 Brown (7.5YR 4/4) silty clay stoneless with many flecks of charcoal; blocky to medium prismatic structure; no roots; diffuse wavy boundary.

145-183 Brown (7.5YR 4/4) silty clay stoneless, one or two charcoal flecks near top; blocky to medium prismatic structure; no roots; abrupt wavy boundary.

183-190 Yellowish red (5YR 4/8) clay with some medium and large tabular oolite pieces; clear irregular boundary.

190+ Stony brown (7.5YR 5/6) clay with extremely abundant large oolite pieces and some small oolite; weathered bedrock/head.

Pit B (described by M. Bell) Plate II

Location: 07271896 Altitude: 250.5 m

Parent material: Hampen Marly Beds with fossils (see geological report by B.C. Worssam p. 2 and Fig. 2).

Relief: virtually level plateau surface. 50 m north of cairn.

Soil: Sherbourne Series.

depth cm.

cultivated

0-40 (7.5YR 4/4) silty clay loam with very few small stones in top 20 cm only; prismatic structure; sharp smooth boundary.

40-82 (localised pocket) Reddish brown (5YR 4/3) silt loam with large medium and sand oolite pieces; involution pocket. 42 cms wide, and deep; sharp smooth boundary.

40-80 Brownish yellow (10YR 6/6) oolitic marl with some small stones and fossils (see Worssam op cit).

80+ shell marl.

100+ oolitic limestone.

Pit C (described by M. Bell) Plate III.

Location: 07401914 Altitude: 246.7 m

Parent material: oolitic limestone.

Relief: shoulder of hill sloping into dry valley. 200 m to north of cairn.

Soil: Sherbourne Series.

depth cm

pasture cover

0-14 Dark brown (7.5YR 4/4) silty clay loam with common oolite stones; coarse granular peds; recently cultivated.

14-16 Dark brown (10YR 4/3) silty clay loam coarse granular peds; organic horizon inverted by cultivation, marks base of recent ploughing.

16-26 Yellowish red (5YR 5/6) silty clay loam; common oolite fragments.

26+ oolite.

Pit D (described by R. Macphail) Plate IV

Location: 07121859 Altitude: 234.6 m

Parent material: Hampen Marley Beds Head.

Relief: towards bottom of slope (valley bottom) south of (340 m) barrow. Against walls. Aspect/slope: 5^{o} south (valley 6^{o} east).

Soil: Didmarton Series: deep clayey brown calcareous earths in Head and colluvium containing limestone rubble (Courtney and Findlay, 1978; Clayden and Hollis, 1984 (in press).

depth cm

pasture cover

Ap 0-24 Brown (10YR 4/3) very firm clay; medium to coarse angular clods; common medium and small limestone stones; moderately humic; common fine roots; charcoal present; gradual, wavy boundary.

B 24-67 Strong brown (7.5YR 4/6) to dark yellowish brown (10YR 4/4) very firm clay; medium to coarse prismatic; many (and increasing) stones with depth; few fine roots; charcoal present; abrupt, smooth boundary.

B(g)2 Brown (7.5YR 4/4) very firm clay with few discontinuous ferro-
67-83 manganiferous pans and distinct, fine mottles; few stones; coarse prismatic; few fine roots; few coatings; manganese stained peds; clear, smooth boundary.

B/C Brown (7.5YR 5/4) and reddish yellow (7.5YR 6/8) heterogeneous,
83-100 moderately weak sandy clay loam; structureless/massive; common fine to coarse stones; clear, wavy boundary.

C2(marl) Light yellowish brown (2.5YR 6/4) moderately weak silty clay;
100-122 structureless; few stones; common manganese staining; clear, even boundary.

C3(head)
122+

Pit E (described by M. Bell) Plate V

Location: 07231874 Altitude: 243.5 m

Parent material: oolitic limestone.

Relief: gently sloping into valley. 170 m to south of cairn.

Soil: Sherbourne Series

depth cm
pasture cover

0-22 Dark brown (7.5YR 4/4) silty clay with 5% medium oolite stones which show it has been cultivated in recent years; abrupt wavy boundary.

22-34 Reddish brown (5YR 4/4) silty clay with 1% medium oolite stones and numerous very small rotted oolites suggesting a partly decalcified and mixed former stone accumulation horizon; sub angular blocky structure; clear wavy boundary.

35-53 Yellowish red (5YR 4/6) silty clay virtually stone free with

poorly developed subangular blocky structure.

53+ oolite.

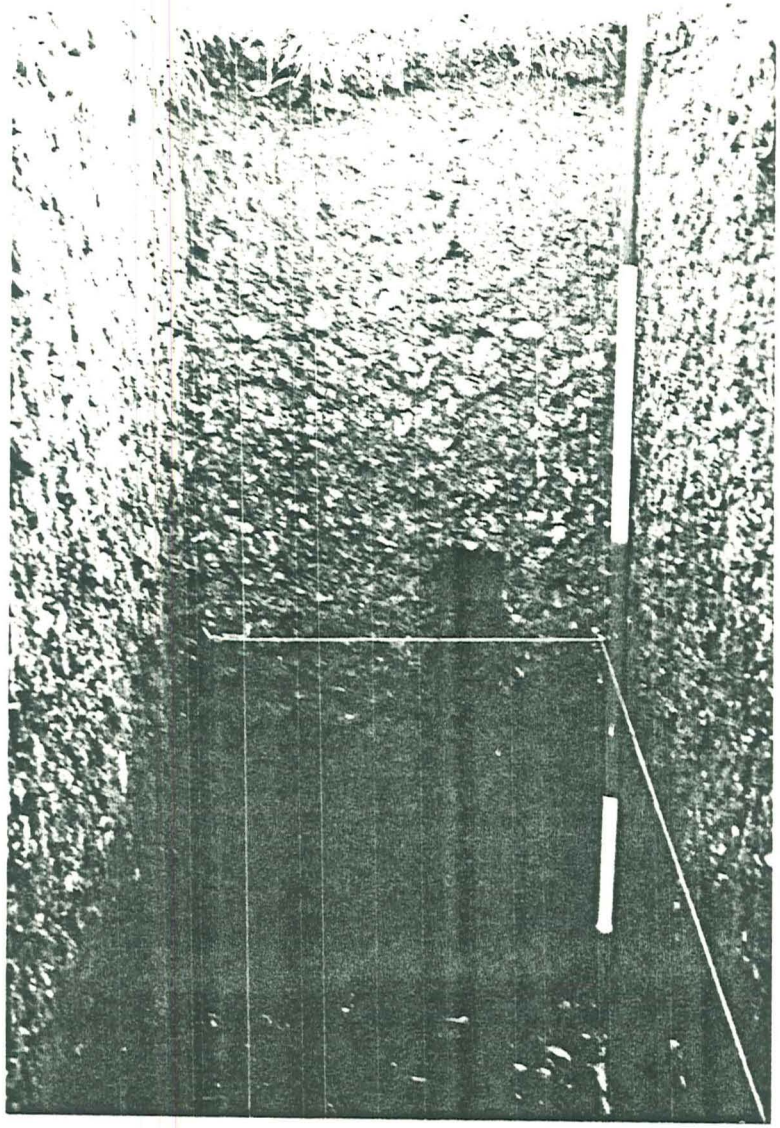

Plate I Soil Pit A

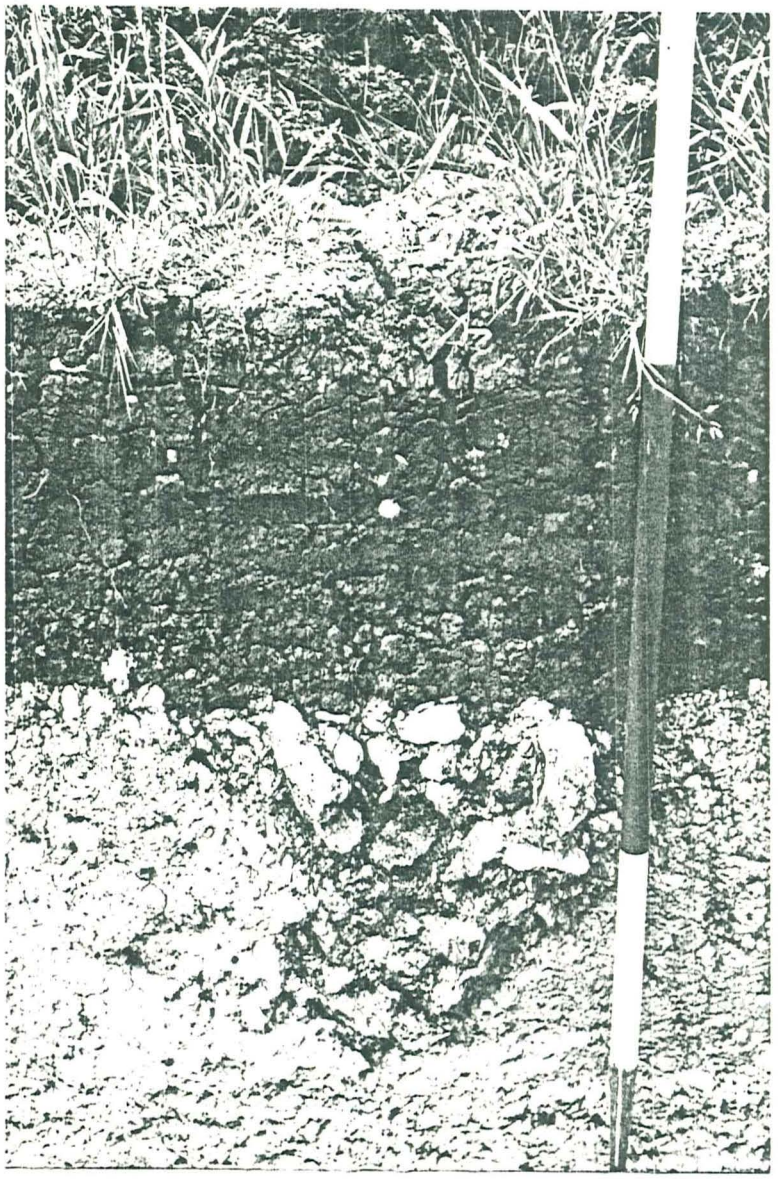

Plate II Soil Pit B

Plate III Soil Pit C

Plate IV Soil Pit D

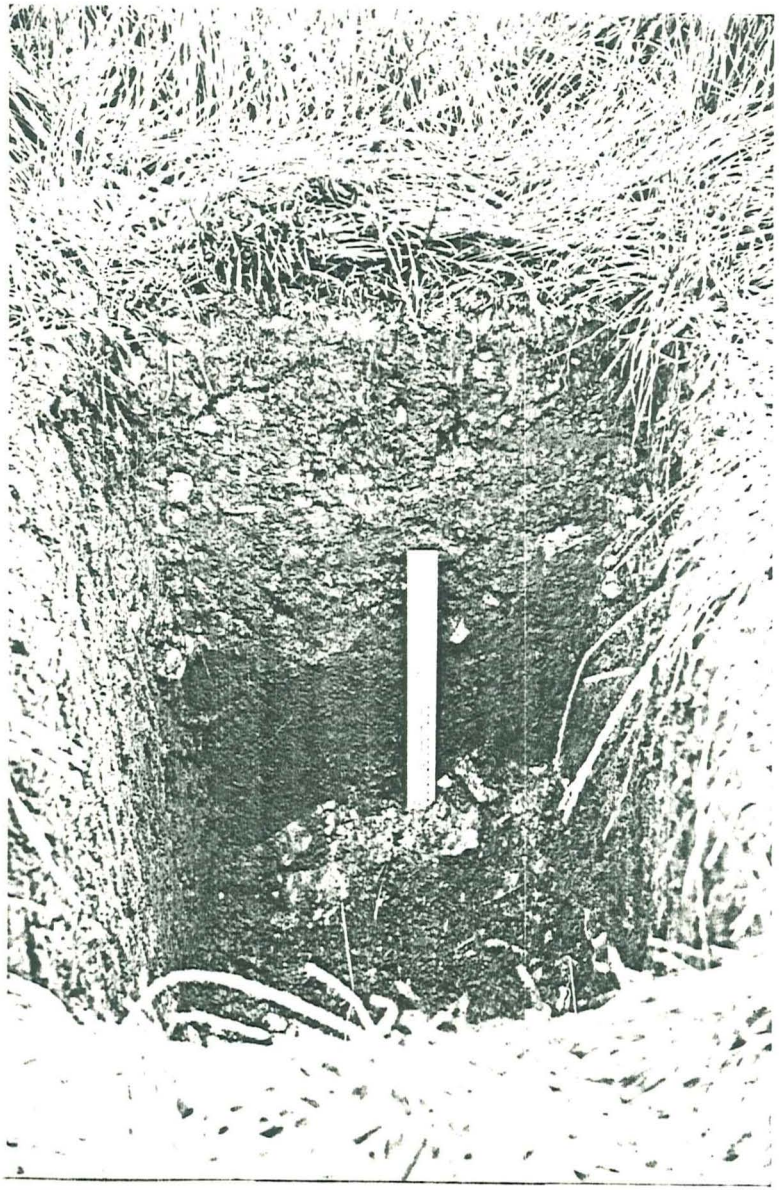

Plate V Soil Pit E

Hazleton Landscape Transect 1982