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The Shaugh Moor Project: Fourth Report - Environment, Context and Conclusion

By N. D. Balaam, K. Smith and G. J. Wainwright

Microfiche pages 1 - 72

Contents

Tables

Figures

The Soils
R I Macphail

Soils of the Saddlesborough Reave area.

During the summer of 1980, excavations at Shaugh Moor were extended to the Saddlesborough reave, it was hoped to establish the nature of the land boundaries which characterise this part of Dartmoor.

In this area the reave runs downslope in a south-easterly direction away from Saddlesborough and it was investigated by a number of sections at progressively lower elevations between approximately 300 and 285 metres OD. Sections in a number of trenches were studied in detail (trenches AN, AM, AL, AJ, AI, and AG; see figure 1). Profiles Ai and Aii are examples of modern soils adjacent to trenches AN and AG respectively. The soils were described,ignited to give a visual indication of their iron content and thin sections were made of material from trenches AL and AJ.

Profile descriptions and ignition analysis of the buried soils show a progressive soil change downslope from AN to AG (stagnopodzols to gley podzols). This takes the form of increasing drainage impedance, from the slightly imperfectly drained humus ironpan stagnopodzol (AN), to badly drained humic (peaty) gley podzols (AM, AL, AJ, AI and AG). Indeed, further downslope the buried soils have relatively thick (15 cms) peaty horizons. Ignition analysis illustrated the concentration of iron in the Bf and Bs horizons of the soil at AN, while the Bg horizons of the soils at lower elevations (AJ, AI and AG) have far less iron because it has been removed laterally by waterlogged (reducing) conditions. In the field, the increasing percentage of grey mottles in the Bg horizon downslope shows how reducing conditions become dominant at lower elevations on Saddlesborough (see soil descriptions, below).

The bleached character of the buried Ah and Eag horizons indicates the podzolised nature of the soils prior to ditch and reave construction. The present day soil profiles (Ai and Aii) are seen to be slightly more eluviated than the buried soils. This is probably a result of their having been subject to a longer period of weathering. Similar variation between buried and unburied soils was observed at Site 15 (the enclosure, Smith and Wainwright 1981). However, despite the slight difference in eluviation there is evidence of severe degradation of the soils buried beneath the Saddlesborough reave.

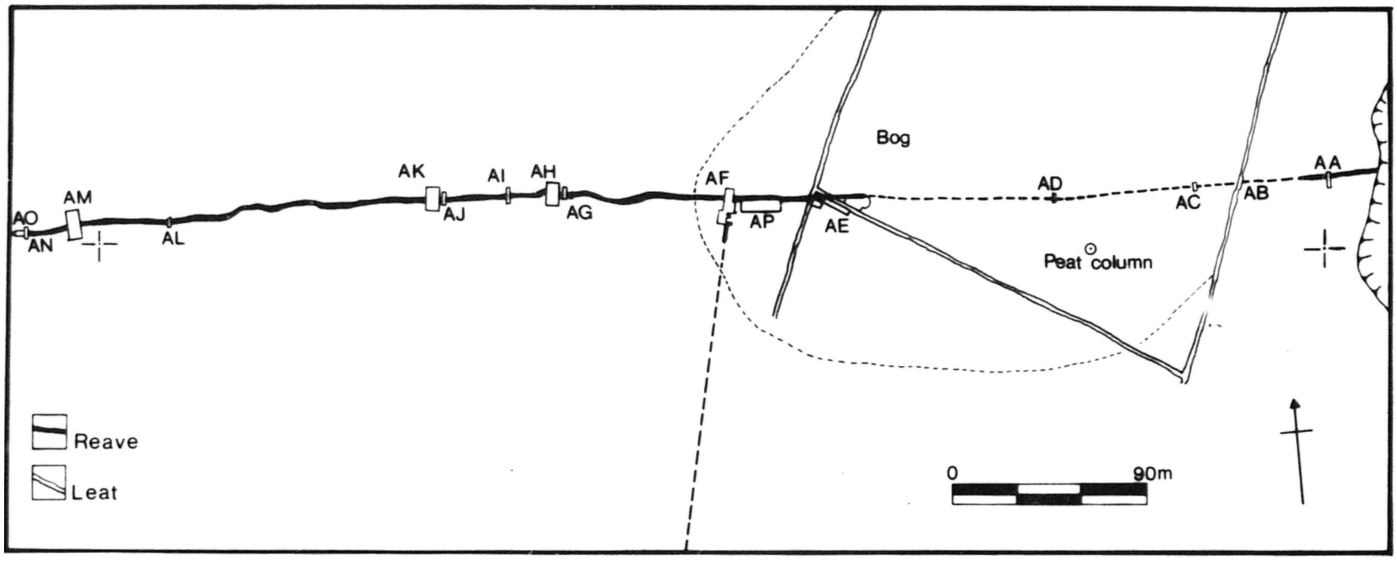
It should be noted that woodland clearance on such upland areas leads to the incursion of moorland heath and grass types and a decrease in the rate of transpiration.Under such conditions an acid, waterlogged turf develops. The turf becomes peaty and increased weathering of the underlying soil occurs through podzolisation and reduction, with the loss of elements such as

iron. Clays may also be broken down. On elevated shoulders of slopes lateral drainage in the upper soil produces ironpans beneath the gleyed Eag horizon and over the oxidised (podzolic) Bs horizon (Crompton 1952). Downslope drainage deteriorates leading to peaty gleys and peats.

Ignition of samples from the reave bank reveals that this material, although Bg horizon in origin, contains very little iron; probably related to strong reducing conditions in the ditch from which the material was dug. At AJ it is possible to show that as the material was dug from the ditch it was inverted, with the less degraded material from the lower levels having been dumped upon the more weathered ditch fill.

The micromorphological study of the bank material may suggest a possible timescale of 10 to 50 years between ditch clearances. Peat and Ah horizons have formed on and in this dumped soil (which is generally described as Bg horizon material). Where this material is thin and very weathered under the peat and Ah horizons it may be described as an Eag horizon. Generally, the earliest dumps seem to have been exposed for relatively short periods, while the later dump (as seen in trench AJ) is likely to have been weathered and pedologically affected for much longer before being buried by the stone reave (see micromorphology section).

Figure 1
Plan showing positions of trenches along the line of the Saddlesborough Main Reave.



Profile descriptions:

Elevation: >285 metres, altitude of profiles decreasing from AN to AE.
Parent Material: All profiles are on granitic head.

AN

Soil subgroup: humus-ironpan stagnopodzol
Slope: 5-6 degrees South.

Horizon/depth (cms)	
Reave	
47-0	Stone and soil overburden, shallow peaty top. Contains fine sandy loam lens.
Old ground surface.	
Ah 0-8	Black (5YR 2.5/1) moderately weak sand; weak medium subangular blocky; common fine roots; humose; common very small stones; abrupt irregular boundary.
Eag 8-11(12)	Pinkish grey (5YR 6/2) weak sand; weak, medium subangular blocky; few fine roots; common very small stones; clear irregular boundary. (under reave extends deep into B(s)).
Bh 11(12)-14(17)	Very dark grey to black (5YR 3/1-2.5/1) weak loamy sand; weak medium subangular blocky; common very small stones; humose; sharp irregular boundary.
Bf 14(17)-14.5(17.5)	Red (2.5YR 5/8) relatively firm ironpan.
Bs 14.5(17.5)-22	Reddish yellow relatively firm loamy sand; massive; common very small stones; humic stain; gradual irregular boundary.
B(s) 22-42+	Brown (7.5YR 5/4) moderately weak loamy sand; coarse blocky; common very small stones; humic stain; gradual irregular boundary to B/C.

AM (Pollen profile 208-1003)

Soil subgroup: humic (peaty) gley podzol
Slope: 5 degrees South.

Reave	
45-9	Stone and soil overburden, peaty top overlying earlier dump; abrupt, smooth boundary.
1st Dump	
Ah	Black (5YR 2.5/1) moderately weak sand; fine
9-5	blocky; common fine roots; common very small stones; humose; abrupt smooth boundary.
Eag	Brown (7.5YR 4/2-5/2) moderately weak loamy
5-0	sand; fine blocky; few fine roots; many very small stones; slightly humose; sharp, uneven boundary.
Old ground surface	
bOh	Black, generally stone free peat; common fine
0-3(4)	roots; abrupt smooth boundary.
bAh	Black to very dark grey (5YR 2.5/1-3/1)
3(4)-6(11)	moderately weak sand; fine to medium blocky; many very small stones; humose; clear irregular boundary.
bEag	Dark brown (7.5YR 3/2) moderately weak loamy
6(11)-11(14)	sand; fine to medium blocky; very common very small stones; gradual irregular boundary.
bBg	Strong brown (7.5YR 5/8) moderately firm
11(14)-35+	loamy sand, with common (20%) medium distinct light yellowish brown (10YR 6/4) mottles; many very small stones; organic matter rich lenses.

AL (Pollen profile 208-1011)

Soil subgroup: humic (peaty) gley podzol
Slope: 4 degrees South.

Reave	
60-32	Stone and soil with peaty top overlying earlier dump; gradual; uneven boundary.
2nd Dump	
Ah	Dark grey (5YR 4/1) moderately weak sand;
32-22	fine blocky; common fine roots; common very small stones; humose; gradual, smooth boundary.
1st Dump	
bOh/Ah	Broken black, generally stone free peat;
22-18	common fine roots; abrupt discontinuous, smooth boundary.
bBg	Strong brown (7.5YR 5/8) moderately firm
18-0	loamy sand, with many (40%) medium distinct (light yellowish brown) mottles; many very small stones; abrupt smooth boundary.
Old ground surface	
bOh 2/bAh 2	Black to very dark grey (5YR 2.5/1-3/1)
0-11	moderately weak peat to sand; fine blocky; patches of very fine stones; humose; abrupt smooth boundary.
bEag 2	Brown (7.5YR 5/2) moderately weak loamy sand;
11-15	fine to medium blocky; many very small stones; clear wavy boundary.
bBg 2	Strong brown (7.5YR 5/6) moderately firm
15-32	loamy sand, with many distinct medium mottles; many very small stones.

AJ (Pollen profile 208-1002)

Soil subgroup: humic (peaty) gley podzol
Slope: 2 degrees South locally

Reave	
51-13	Stone and soil with peaty top overlying earlier dumps; broken abrupt boundary.
2nd Dump	
bBg	Brown to very pale brown (10YR 4/3-7/3)
13-9	moderately weak loamy sand; medium to fine blocky; many very small stones; broken, abrupt boundary.
1st Dump	
bOh/Ah	Broken black peat; fine blocky; humose;
9-7.5	abundant fine roots; many very small stones; sharp, smooth boundary.
bBg 2	Dark greyish brown (10YR 4/2) weak loamy
7.5-0	sand, with few fine distinct mottles; fine to medium blocky; many very small stones; abrupt, smooth boundary.
Old ground surface	
bOh 2/Ah 2	Black peat with many very small stones;
0-8	medium blocky; abrupt smooth boundary.
bAh 2	Black (5YR 2.5/1) weak sand to loamy sand
8-10	medium blocky; humose; many very small stones; wavy boundary.
bEag	Brown (10YR 5/3) weak loamy sand; many very
10-18	small stones; gradual irregular boundary.
bBg 3	Light grey (10YR 7/2) moderately weak loamy
18-28	sand, with very many (50%) distinct (reddish yellow) mottles; many very small stones.

AI

Soil subgroup: humic (peaty) gley podzol
Slope: 1-2 degrees South.

Reave	
45-27	Stone and soil overlying earlier dumps, with turf top and merging with gravelly humose material beneath.
2nd Dump	
Ah	Very dark grey (5YR 3/1) moderately weak
27-10	loamy sand; medium blocky humose; few fine rootsmany very small stones; broken clear irregular boundary.
Eag	Pinkish grey (7.5YR 6/2) moderately weak
10-7	loamy sand; fine to medium blocky; relatively humose; many very small stones; sharp irregular boundary.
1st Dump	
bAh	Black (5YR 2.5/1) moderately weak loamy sand;
7-4	fine to medium blocky; humose, many very small stones; sharp, even boundary.
bEag	Pinkish grey (7.5YR 6/2) moderately weak
4-0	loamy sand; fine to medium blocky; humose zones; many very small stones; sharp smooth boundary.
Old ground surface	
bOh/Ah2	Black (5YR 2.5/1) moderately weak peaty
0-6	humose sand; few fine roots; many very small stones; gradual wavy boundary.
bAh3	Black (5YR 2.5/1) moderately weak loamy sand;
6-10	fine blocky; few fine roots; many very small stones; clear irregular boundary.
bEag2	Very dark grey to grey (5YR 3/1-5/1)
10-17	moderately weak loamy sand; humus stained ; few very small stones; gradual irregular boundary.
bBg	Yellowish brown (10YR 5/4) moderately weak
17-30+	sandy loam, very many (80%) fine to coarse prominent (orange) mottles; medium blocky to fine medium prismatic; humus lenses; old root channels; few very small stones.

AG (Similar to pollen profiles 208-1014 and 208-1018)

Soil subgroup: humic (peaty) gley podzol
Slope: 12 degrees South.

Reave	
36-0	Stone and soil over buried soil.
Old ground surface	
Oh	Black, peaty; few very small stones; abrupt
0-6	smooth boundary.
Ah	Black (5YR 2.5/1) moderately weak sand;
6-11	medium blocky few fine roots; very many small stones; clear irregular boundary.
Eag	Brown (7.5YR 5/2) moderately weak loamy sand;
11-18(20)	fine to medium blocky; many very small stones; gradual irregular boundary.
Bg	Light yellowish brown (10YR 6/4) moderately
18(20)+	weak sandy loam, with many (35%) faint brownish yellow mottles, humose stains; many very small stones.

Ai

Soil subgroup: humus ironpan stagnopodzol.
Slope: 5 degrees South.
Vegetation: moorland grass and heather.

Horizon/depth (cms)	
Oh 6-0	Black moist peat, many fine roots.
Ah 0-4	Black (5YR 2.5/1) moderately weak sand medium to coarse subangular blocky; common fine roots; humose; common very small stones; abrupt wavy boundary.
Eag 4-12(20)	Grey to pinkish grey (5YR 6/1-6/2) weak sand with dark grey (5YR 4/1) patches; weak medium subangular blocky; few fine roots; common very small stones; gradual irregular boundary.
Bh 12(20)-40(45)	Very dark grey to black (5YR 3/1-2.5/1) weak loamy sand; weak medium subangular blocky; common very small stones; humose; sharp, irregular boundary.
Bf 40(45)-40.5(45.5)	Red (2.5YR 5/6) firm ironpan.
Bs 40.5(45.5)-62	Yellowish red to reddish yellow (5YR 5/6-6/8) moderately firm loamy sand; massive; common very small stones; becoming paler (7.5YR5/4-5/6) with depth; gradual irregular boundary.
B/C 62+	Yellow (10YR 7/6) stony sand.

Aii

Soil subgroup: Humic (peaty) gley podzol
Slope: 10 degrees South.
Vegetation: mainly Molinia grass.

Horizon/depth (cms)	
Oh 27-0	Black to brown moist coarse blocky peat, many fine roots in upper part.
Ah 0-3	Black (5YR 2.5/1) moderately weak loamy sand; medium subangular blocky; few fine roots; few very small stones; clear wavy boundary.
Eag 3-8	Brown (5YR 5/4) moderately weak loamy sand; fine to medium subangular blocky; many very small stones; clear, wavy boundary.
Bg 8-52	White to very pale brown (10YR 7/2-7/4) moderately weak loamy sand; blocky to weak prismatic; common small stones; diffuse irregular boundary.
Cg 52+	White to very pale brown (10YR 8/2-7/3) weak stony sandy loam.

Micromorphology of the bank material and weathering horizons in trenches AL and AJ.

Thin sections were manufactured of soil material from the bank beneath the stone reave, this comprised spoil dug from the adjacent ditch. Later cleaning of the ditch allowed additional spoil to bury peaty horizons formed in earlier dumped material.

It is usually considered impossible to assess the rates of weathering in moorland soils as gleying and podzolisation reduce the soil material to bleached quartz and amorphous organic matter. However, on the Saddlesborough reave, the bank material, which is derived from the Bg horizon, includes weathered granite and not only are granite lithorelics (of orthoclase feldspar, quartz and biotite) present, but also individual minerals such as microcline (another alkali feldspar), dumortierite (boron aluminium silicate) and micas (mainly biotite) occur in various stages of weathering. Biotite is less stable than the alkali feldspars and with the loss of iron, potassium, magnesium and sodium and the addition of water may alter eventually to vermiculite (Brewer 1964; Mason 1966). Such stages may be visible as loss of pleochroism, splitting of the mineral, local presence of "free" iron (mostly goethite), and breakdown of "fines" without free iron. These stages can be described as being unweathered, relatively weathered or much weathered.

In the sample from trench AJ the mica (biotite) tends to be more weathered in the lower part of the bBg2 horizon (1st dump) than in the upper part, even though this zone is far more affected by surface weathering and soil formation extending down from the bOh/Ah horizon above. Indeed the lower zone has very little amorphous organic matter and is only affected by rooting rather than faunal reworking. This suggests that this bBg2 horizon has become inverted when dug out from the ditch, and the more weathered character of the lower zone relates to it having been more highly reduced in the upper levels of the ditch fill.

In trench AL the much weathered nature of the biotite in the bOh/Ah horizon, in comparison with the less degraded biotite and the presence of free iron in the underlying bBg horizon, relates to pedogenesis and peat formation in the bOh/Ah horizon. Although burial by the overlying Ah horizon and reave material may not have resulted in the total cessation of weathering, it may be possible to suggest a time scale of approximately 10-50 years before the subsequent dich clearance. It may also be noted that the dumped horizons have a far higher bulk density (ie. fewer voids) than the organic horizons which have developed upon them. This again suggests that these dumps were only affected by biological activity for a relatively short time (see the bBg horizon at AL and the bBg2 horizon at AJ). On the other hand the the later dump at AJ (bBg) has much more void space, has developed a silasepic fabric and has been biologically much more reworked (earthworm droppings), and thus most probably remained unburied for a much longer period. It may be noted that such features as those above are unlikely to have developed

significantly after burial because they are absent from other buried dump layers also examined (see below).

Micromorphology: descriptions

Trench AL Context 1016

Horizon

Ah — Homogeneous; fine blocky of diffuse pellety aggregates; approximately 8% voids, vughs, few channels; both simple packing and compound packing voids; approximately 29% skeletal minerals - fine, medium, coarse sands; very small granite lithorelic; angular to sub angular; mineral component includes approximately 7% orthoclase feldspar, plus micas (biotite); both relatively weathered and much weathered (see text); much (54%) organic matter, mainly amorphous, distinct mite droppings; little iron present; porphyroskelic, rarely silasepic; undulic plasmic fabric.

bOh/Ah — Homogeneous; (macro) subangular fine blocky; fine and coarse (0.25 - 1.6mm) sub rounded pellety aggregates; approximately 13% voids; vughy; few channels and orthovughs; compound packing voids; 10% skeletal minerals, mainly quartz; includes 4% orthoclase feldspar; angular; granite lithorelics; micas (biotite) much weathered, iron mainly removed; 77% organic matter, mainly amorphous, semi-humified and root material, agglomeroplasmic to porphyroskelic; undulic plasma fabric.

bBg — Homogeneous; (macro) medium blocky; very coarse (1.0mm) organic peds, sub-angular, relatively porous; approximately 6% voids; orthovughs; compound packing voids; well formed channels; 37% mineral grains; mainly orthoclase feldspar; micas (biotite) generally unweathered or relatively weathered, some much weathered; dumortierite present; 27% organic matter, mainly amorphous; common root material; 20% organic matter/mineral plasma; mite droppings; iron staining on minerals; 10% silasepic; mainly undulic plasmic fabric.

Trench AJ Context 1008

base of Bg

Homogeneous; fine subangular blocky; approximately 18% voids; compound packing voids; orthovughs and metavughs, common channels; 51% mineral grains, angular to subangular very small stones; much fine sand and silt; minerals include quartz, orthoclase feldspar and much weathered biotite; 12% organic matter, amorphous root fragments and earthworm droppings containing fine mineral matter; 19% organic matter-mineral silasepic plasma; generally iron free; silasepic, agglomeroplasmic.

bOh/Ah

Homogeneous; loose pellety peds to fine subangular blocky; approximately 21% voids; vughy, orthovughs; simple packing voids; few channels; 22% mineral grains, quartz, orthoclase feldspar and mica (biotite); angular granite lithorelics, coarse and medium sand; some silt; relatively weathered biotite; 60% amorphous organic matter; roots; droppings; no iron; intertextic and agglomeroplasmic; undulic plasmic fabric.

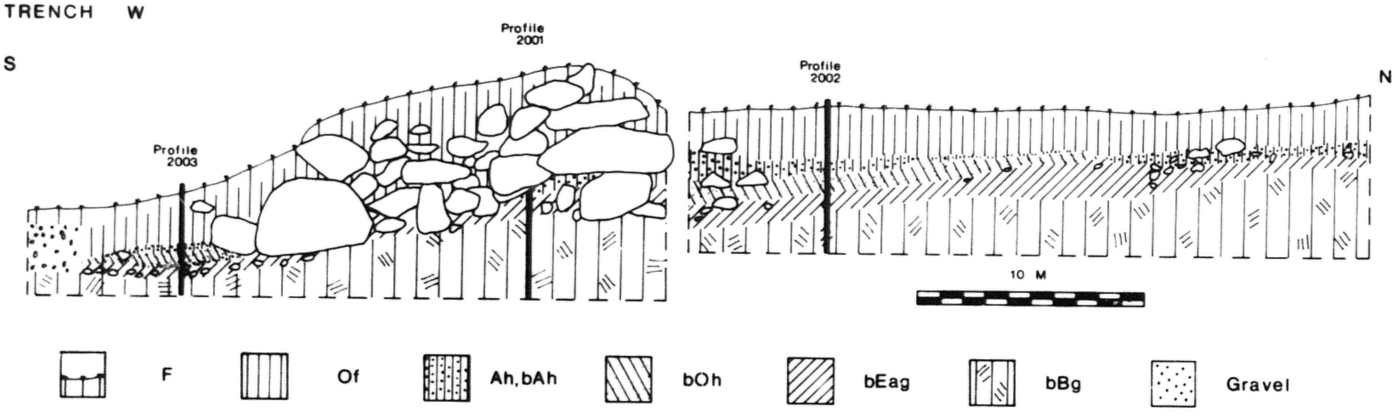
bBg 2 (upper)

Homogeneous; (macro) medium to coarse subangular blocky; approximately 5% voids; orthovughs; only fine channels; compound packing voids; 52% mineral grains; more orthoclase feldspar than quartz; very common very small stones, including microperthite and boron mineral dumortierite; angular coarse and medium sands; little silt; mica (biotite) relatively weathered; 43% amorphous organic matter or organic matter dominated plasma; mineral mixing; clean grains; agglomeroplasmic fine structure, porphyroskelic; undulic plasmic fabric.

bBg 2 (lower)

Homogeneous; (macro) fine subangular blocky; loose pellety peds; approximately 7% voids; orthovughs, some metavughs; simple and compound voids; 46% mineral grains; angular, very small lithorelics, coarse and medium sand; little silt; much orthoclase feldspar; quartz, mica (biotite) present; dumortierite common; biotite much weathered; little (2%) amorphous organic matter; root fragments present; diffuse manganic glaebules present; little iron; silasepic (37%); porphyroskelic; undulic plasmic fabric.

Figure 2
Site 208, Trench W, showing positions of pollen sampling columns



Soils of the Wotter Common area

A section through the Wotter Common reave was examined during the 1979 excavation season. In this section three soil profiles were investigated; 2001, 2002, 2003 (see figure 2). The soils present (humic gley podzols), show severe degradation both under the reave and to each side (see soil descriptions), this was illustrated by the ignited soil profiles (Macphail 1980). However, ignition of the profiles did reveal very slightly more iron in the buried soil B horizon than was present in similar horizons in the other soils and this can be accounted for by its shorter exposure to leaching.

Profile 2001 therefore supports the view of strong soil degradation prior to the construction of the reave. Profiles 2002 and 2003 are good evidence of secondary soil formation during the period after the reave was built. In the case of profile 2003 the peaty cover (bOh) may have thickened before it was buried by the upper Ah horizon. A new peat has formed on top of this more mineral soil (see analytical data, table 1). Similar burial has occurred at profile 2002 although previously erosion had totally removed the Ah horizon of the original soil. Following this truncation (as far as the Eag horizon (2bEag)) the soil was buried under an accumulation of peat (bOh). Subsequently this peat was buried by mineral soil in which the modern Ah horizon developed, this is now overlain by "modern" peat. Thus we have at both profiles 2002 and 2003, burial of soil horizons after the construction of the reave.

The nature of the soil erosion on both sides of the reave was further investigated. The overburden of the buried soils was also assessed to determine its origin. Thus samples for particle size analysis consisted of the Ah and bOh horizons of the soils both upslope and downslope of the reave and the Ah horizon from beneath the reave so that the original upper soil could be compared with the mineral horizons on either side of the reave.

Results: These are presented in table 2. In profile 2002 the buried peat (bOh) represents a stagnation period during which time there was low energy silting up. It is likely that little of the material is derived from the reave (compare particle size of the Ah horizon of the buried soil, profile 2001). The Ah horizon of profile 2002 is typical of a high energy fill, with large quantities of gravel and coarse sand present, in contrast to the silts of the bOh horizon. There is little field or particle size evidence to suggest that tumble has contributed to any great extent to the material in the Ah horizon.

The Ah horizon of profile 2001 has a grain size distribution of the original upper soil, which is missing, for example, from profile 2002.

Downslope of the reave the bOh horizon of profile 2003 again indicates a period of gentle silting up during peat formation. Here, however, there is some suggestion of material added by

tumble from the reave. Th Ah horizon contains high quantities of coarse sand and gravel concommitant with a high energy fill.

Discussion: Field and laboratory evidence suggest that turf from profile 2002 was removed, most probably to heighten the stone built reave. The bEag horizon may also have lost some material during this period of disturbance. Downslope of the reave the soil was not truncated but the boundary between the bOh and the bAh and the rather narrow nature of the Ah horizon suggest some erosion. Indeed there must have been some hollowing effect as the depression formed later became infilled by the bOh and Ah horizons.

The next phase represented is a quiet period of peat formation and slow silting up, some tumble fell downslope. This was then followed by a period or periods of disturbance resulting in the deposition of coarse material in these depressions; finer material was probably washed away during this time. Upslope the coarse material may be derived from colluvium or a stream flow source, while downslope of the reave the gravels are very likely to be associated with stream flow. In fact a much more recent leat, cut into this fill, has itself been infilled with gravels. Thus downslope of the reave there must have been some stream flow laterally across the slope infilling above the peat with gravels. This coarse material later developed into an Ah horizon.

The sequences represented by the deposits either side of the reave as a phase following construction of the reave during which there was little soil disturbance. Later disturbed conditions gave rise to the gravels which rapidly infilled the depressions on either side of the reave.

Profile descriptions; Wotter Common Reave.

Trench W

Profile 2001
Site: Beneath turf and stones of reave.
Parent material: granitic head.
Soil subgroup: Humic gley podzol.
Profile commences approximately 50 cms down from top of reave.

Horizon/depth (cms)	
bAh 0-6	Discontinuous (between stones) black (2.5YR 5/1) coarse sand; weak blocky; many very small stones; many medium old roots; discontinuous clear smooth boundary.
bEag 6-10	Dark grey to reddish grey (5YR 4/2-5/2) coarse sand; moderately weak blocky; many very small and medium stones; rare roots; clear, smooth boundary.
bB(hs)g 10-45	Brown and dark brown (7.5YR 5/4-4/4) sand; moderately weak medium prisms; many very small to large stones; rootless; many coarse faint mottles; and many zones stained with manganese and/or humus.

Profile 2002
Site: 60 cms upslope (NW) of reave; receiving site.
Slope: 4-6 degrees South-East.
Soil subgroup: humic gley podzol.
Vegetation: acid grass and bracken.

F 20-16	Reddish brown, abundant fine grass roots, common bracken rhyzomes.
Of 16-0	Black, fibrous peat, common fine and many coarse roots.
Ah 0-23	Black (7.5YR 2/0) coarse sand; weak medium blocky; abundant very small stones; common fine and few medium roots; horizon narrows upslope (7-9 cms); clear, smooth boundary.
bOh 23-32	Black sandy peat; common very small stones; moderately weak blocky; few fine roots; horizons upslope (5-7.5 cms); abrupt, smooth boundary.
2bEag 32-45	Dark grey (5YR 4/1) in upper part and grey (5YR 5/1) in the lower part, sand; with moderately weak blocky structures; abundant very small stones, and few large stones; few fine roots; gradual wavy boundary.
2bB(sh)g and 2bBh	Dark brown (7.5YR 4/4) sand with narrow (2-4 cms) dark reddish brown (5YR 2.5/2) Bh bands; common faint mottles; weak medium prisms; few fine roots; manganese present on structure faces.

Profile 2003
Site: South-West side of reave, upslope of recut leat and gravel infill.
Soil subgroup: humic gley podzol.

F 18-14	Reddish brown, abundant fine grass roots, common bracken rhyzomes.
Of 14-0	Black, amorphous, sandy peat; fewer roots than above.
Ah 0-25	Black (5YR 2.5/1) coarse sand; moderately weak coarse blocky; many very small stones (gravel); common fine roots; clear smooth boundary.
bOh 25-29	Black, amorphous sandy peat; common very small stones; common fine roots; clear smooth boundary.
bAh 29-33	Black (5YR 2.5/1) coarse sand; moderately weak medium blocky; many very small stones; many fine roots; clear smooth boundary.
bEag 33-36	Dark grey (5YR 4/1) coarse sand; moderately weak medium blocky; many very small to large stones; common fine roots; clear wavy boundary.
bBg 36-56	Brown (7.5YR 5/4) and dark brown (7.5YR 4/2) sand; common, faint mottles; moderately weak medium prisms; many large stones; common manganese staining; few humus stained zones; gradual, irregular boundary.
bC 56+	Granite head.

Table 1

Analytical data, Wotter Common Reave.

Profile	Horizon	pH	%loss on ignition	Alk. Sol. Humus mg/100g
2001	Ah	4.8		372
	bEag	5.2		170
	bB(hs)g	5.4		176
2002	Of	4.3	33.00	912
	Ah	4.8	3.17	208
	bOh	4.5	15.03	1120
	2bEag	4.5		250
	2bB(sh)g	4.9		250
	(Bh)	5.3		520
2003	Of	4.8	30.55	2250
	Ah	5.4	4.39	448
	bOh	5.3	11.20	1536
	bAh	5.5		360
	bEag	5.6		304
	bBg	5.3		304

Table 2

Particle size, Wotter Common Reave.

Profile	Horizon	CL	FZ	MZ	CZ	FS	MS	CS	(Gravel)
2001	Ah	28	5	19	11	5	17	15	(9)
2002	Ah	23	2	8	7	12	17	31	(29)
	bOh	31	6	29	7	12	7	8	(2)
2003	Ah	22	1	10	5	6	17	39	(42)
	bOh	29	14	13	15	7	10	12	(9)

Soil Pollen Analysis

N D Balaam

Sampling

Samples for pollen analysis were cut from freshly cleaned excavation sections. They were taken at one or two centimetre intervals through the buried soils and the reave bank. Towards the top of each section samples were taken at five centimetre intervals.

Stratigraphy

The position of each of the sample columns taken is recorded on the drawn sections in the excavation archive. Diagramatic sections showing major stratigraphic boundaries are included with each pollen diagram. Detailed descriptions of soil characters at different points along the reave are given in the accompanying soil report by Dr Macphail. The pollen profiles to which the descriptions relate are indicated in the soil report.

Location of sample columns

The points at which samples were taken in the Saddlesborough reave area are shown on figure 1 in the printed report. Sample columns 2001, 2002 and 2003 were taken from the section in trench W on Wotter Common (Shaugh Moor Project, Paper 3; Smith et al, 1981). The relative positions of these three samples are shown in figure 2. The samples from the enclosure were taken from the section exposed in a soil test pit at 2160E/770N.

Analysis

Preparation of the samples was according to the method described by Dimbleby (1961). Identifications were made with reference to the keys published by Moore and Webb (1978) and Faegri and Iversen (1964) and by comparison with typeslides in the collection of the University of London, Institute of Archaeology.

Counting

Wherever possible counts were based on a total of not less than 400 pollen grains and spores. Occasionally samples were so difficult to count or contained very little pollen so that lower numbers were counted. The number of grains counted for each sample analysed is shown in the following set of tables (tables 3 to 11).

Pollen assemblage zones

Each of the pollen diagrams presented includes the suggested pollen assemblage zones. In addition, Dr Beckett's two Lee Moor diagrams are illustrated with a proposed subdivision of zone LM5 into LM5a and LM5b.

Figure 3
Pollen diagram: 208-1002

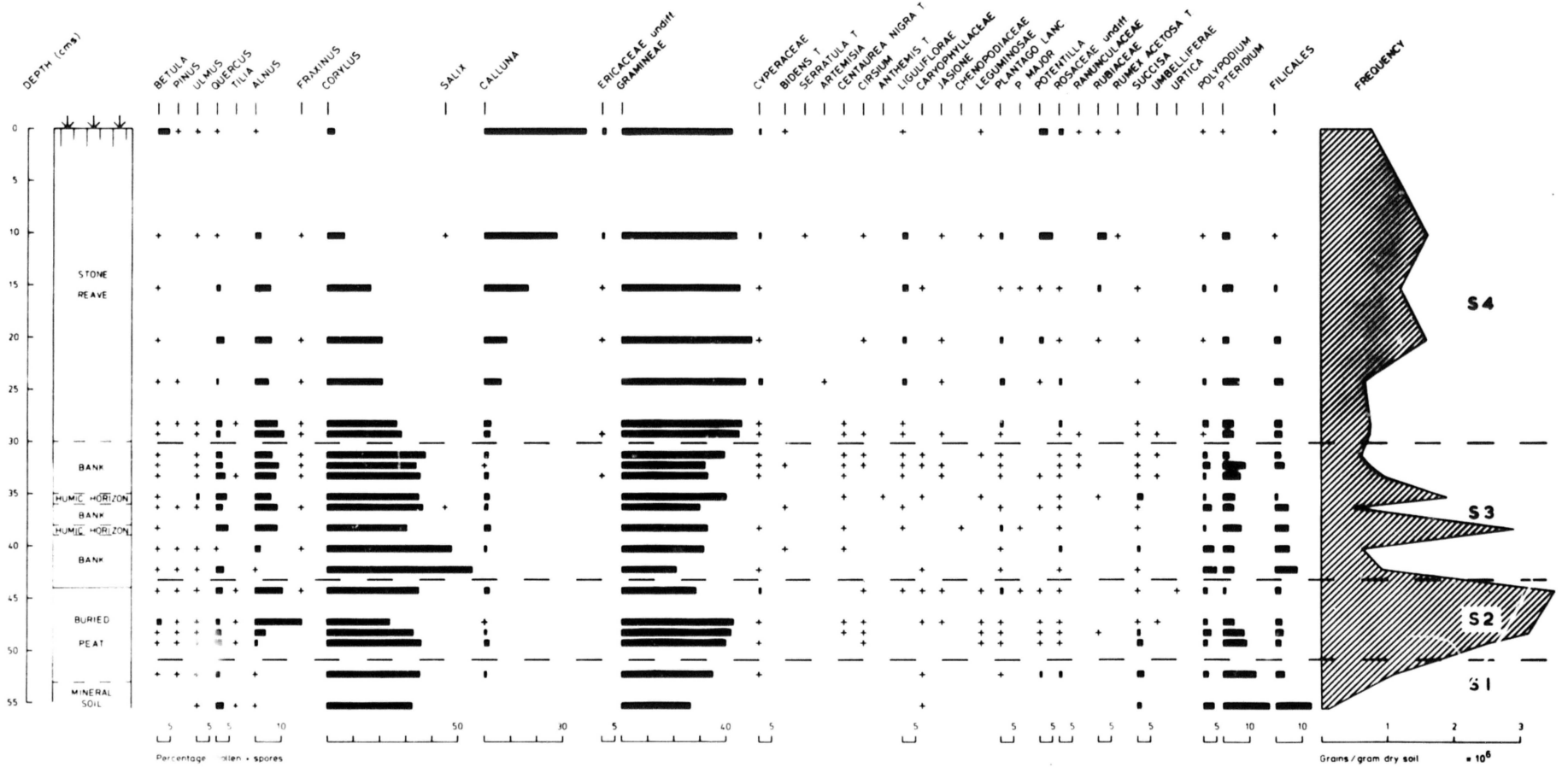


Figure 4: Pollen diagram: 208-1003

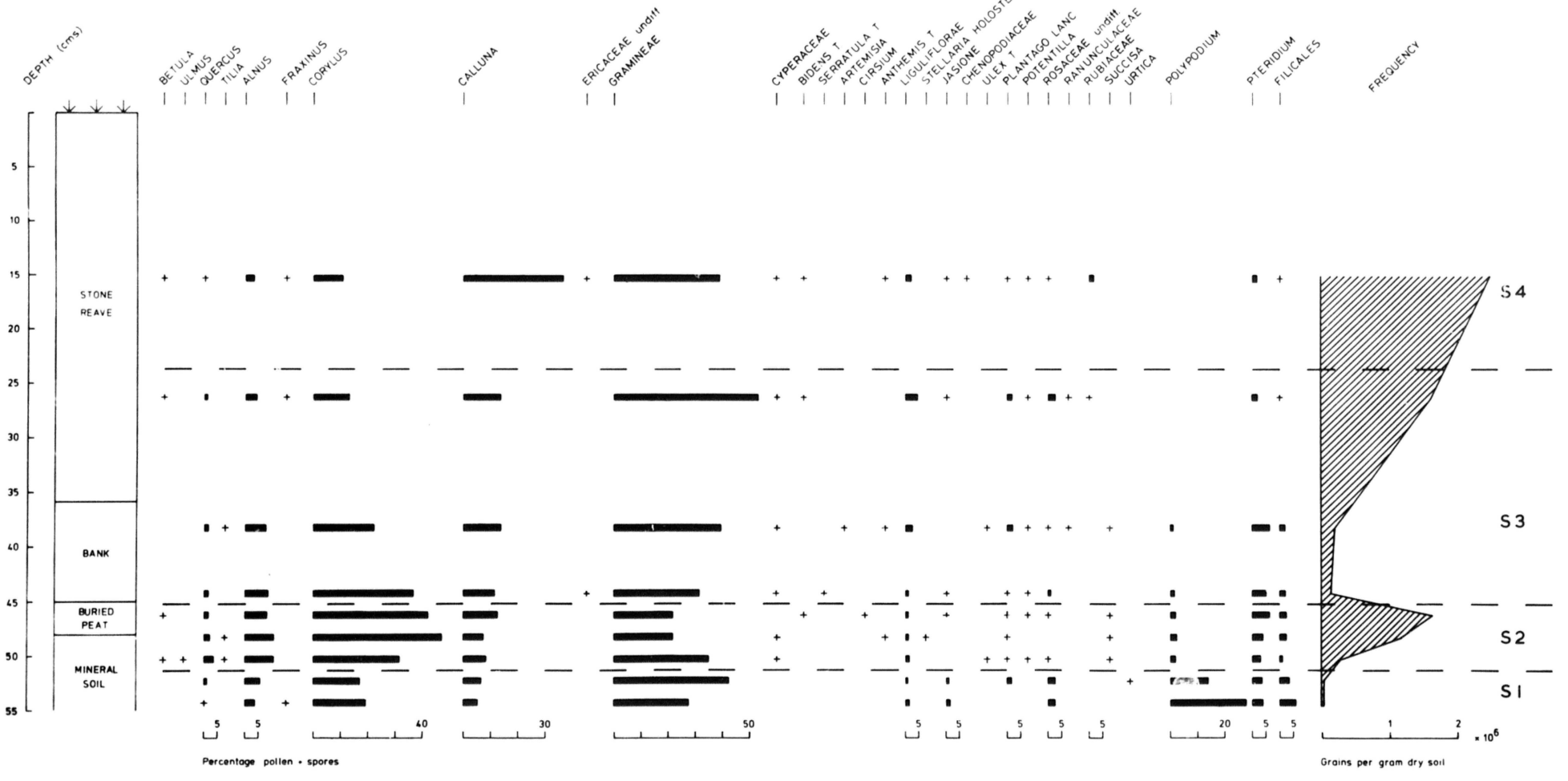


Figure 5: Pollen diagram: 208-1011

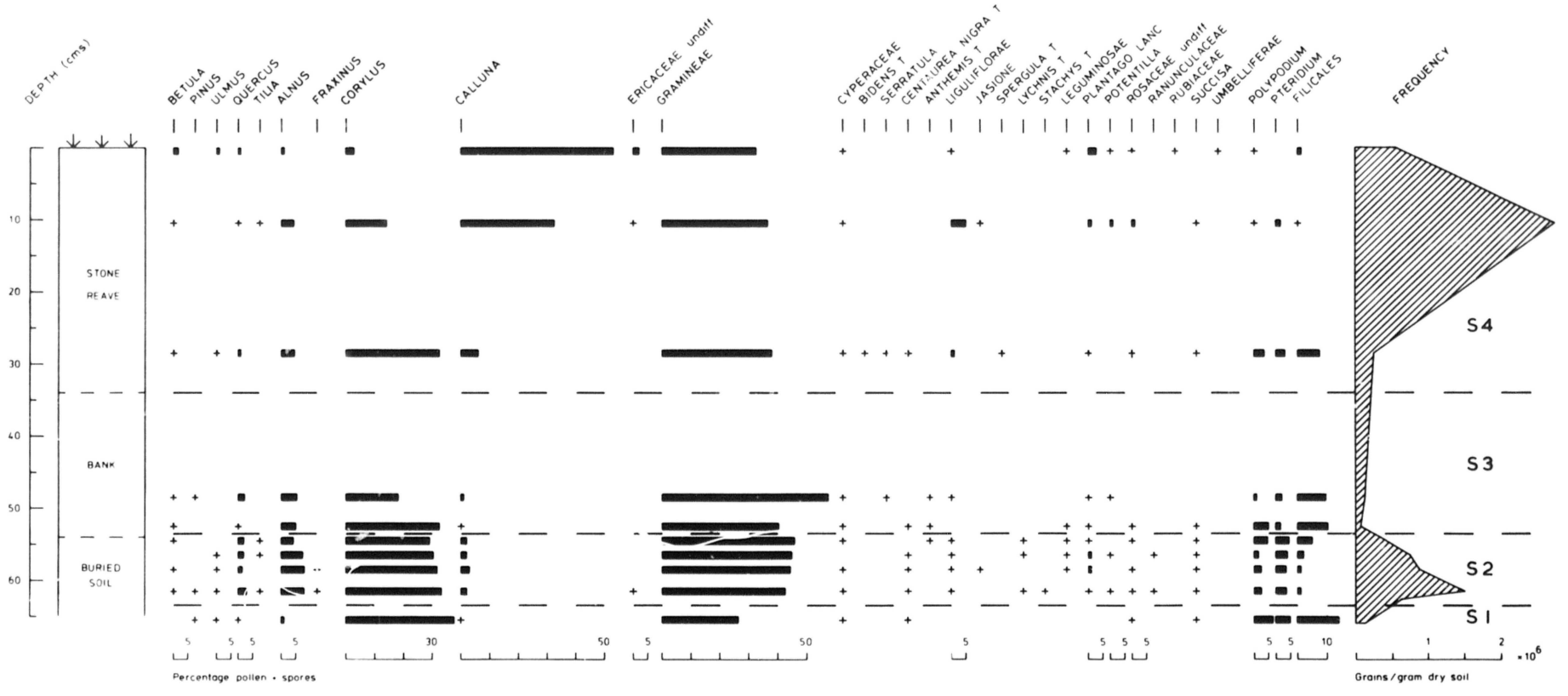


Figure 6
Pollen diagram: 208-1018

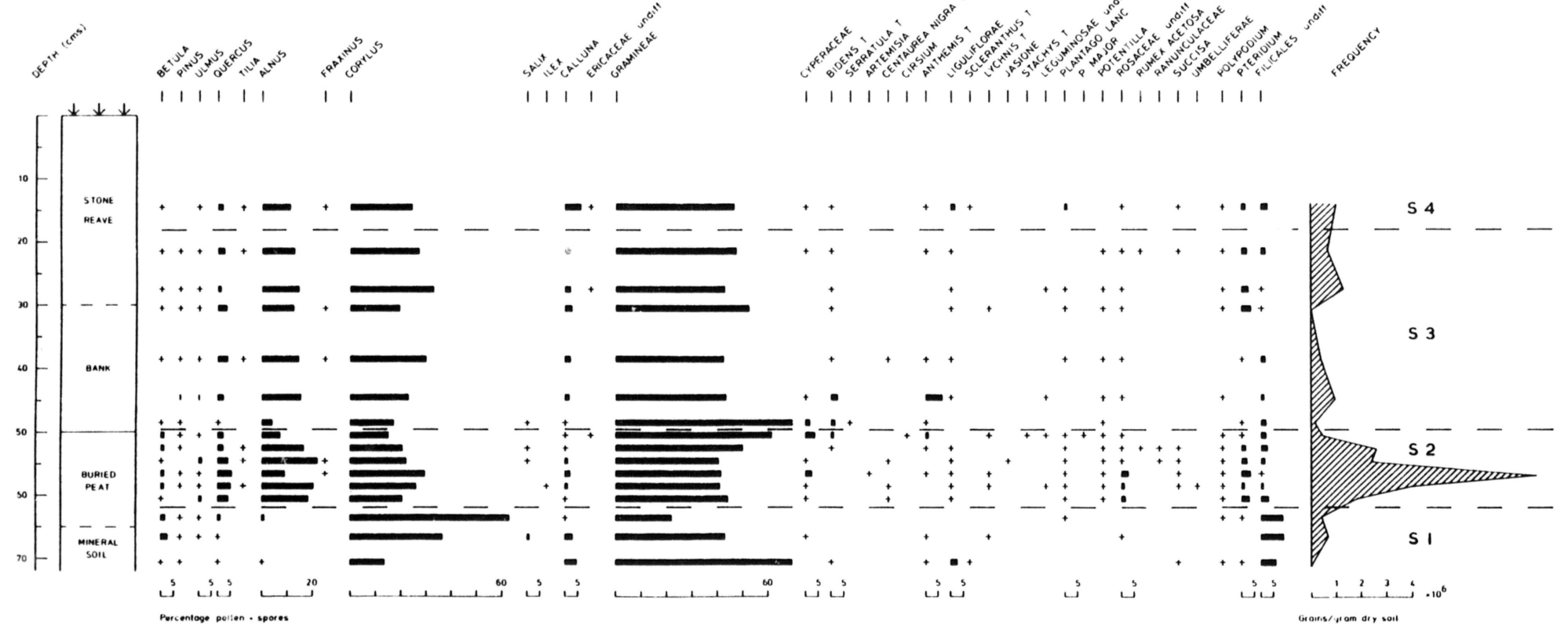


Figure 7: Pollen diagram: 208-2003

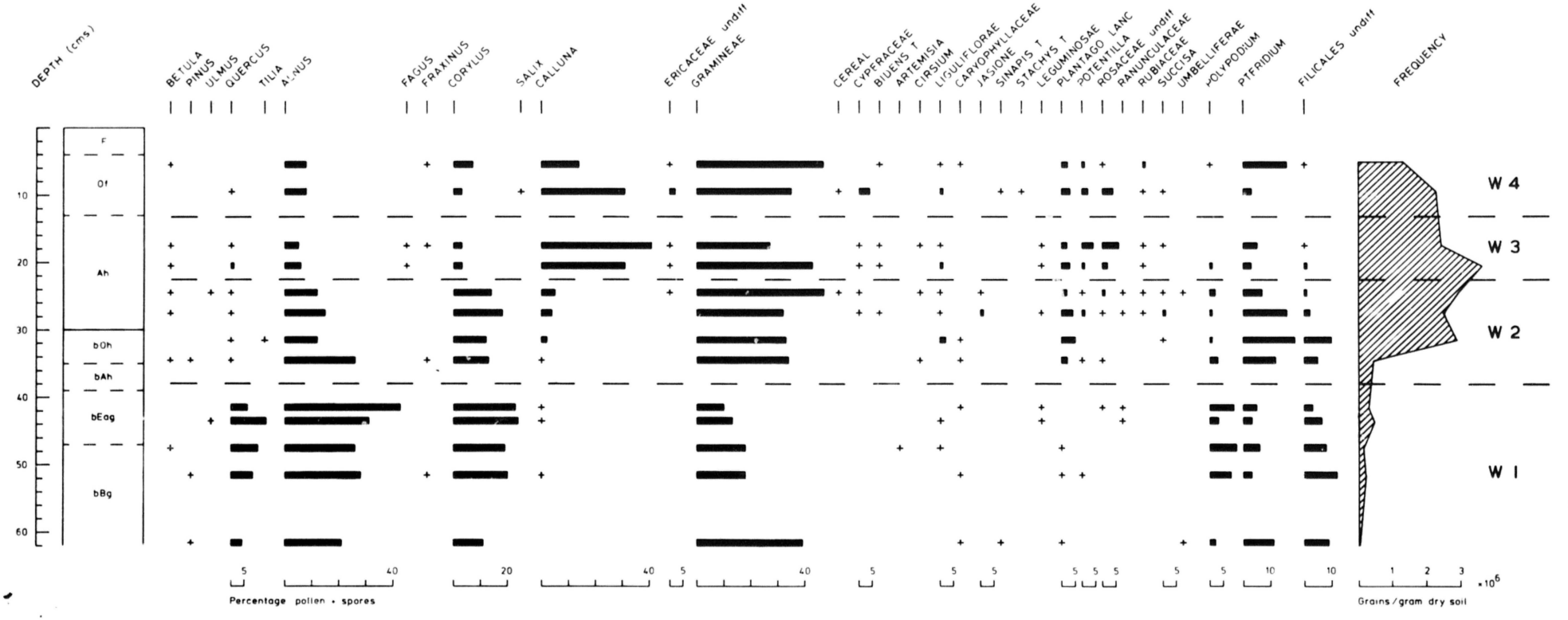


Figure 8
Pollen diagram: Lee Moor, with Zone LM5a indicated (trees and shrubs).

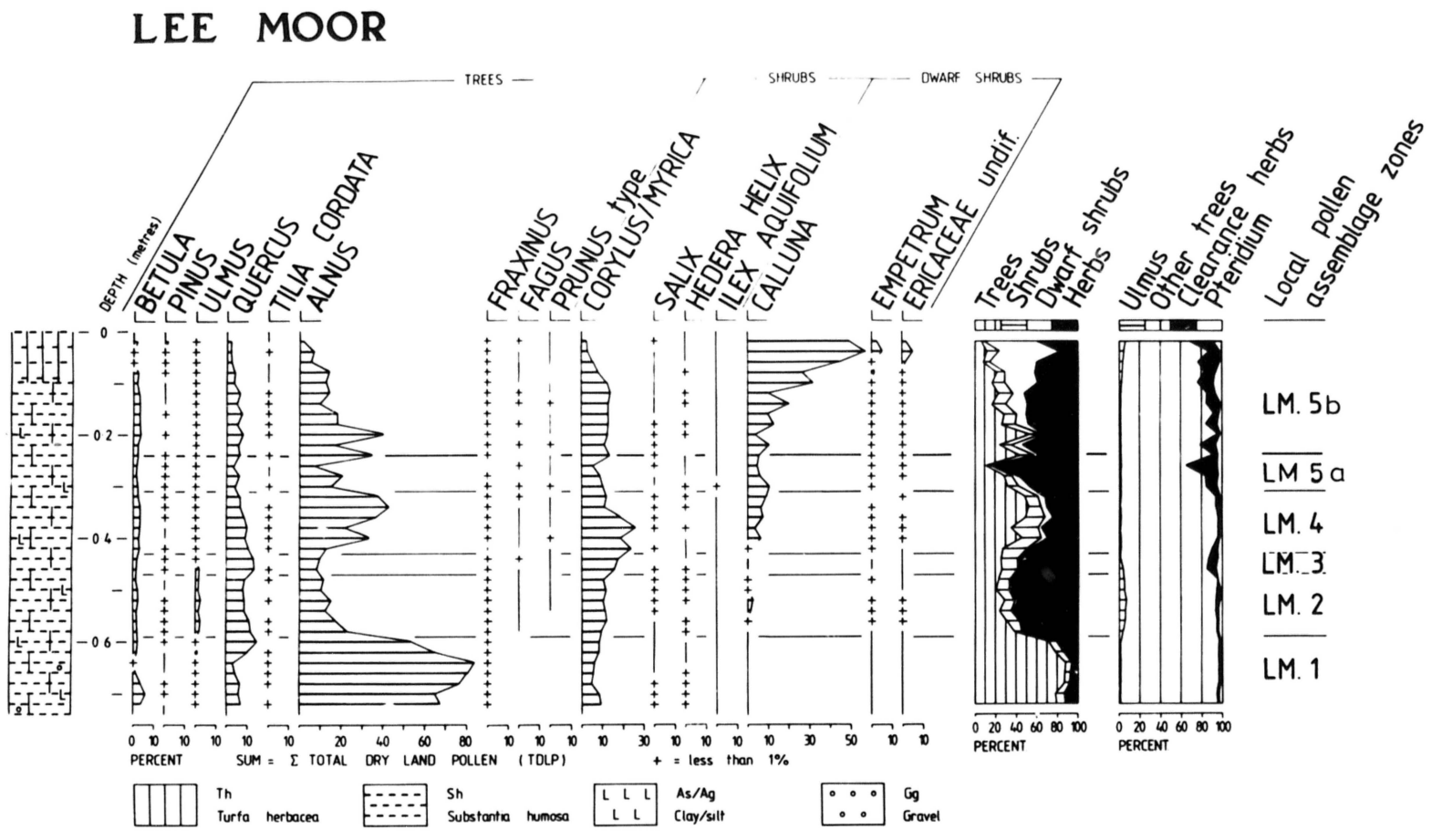


Figure 9
Pollen diagram: Lee Moor, with Zone LM5a indicated (herbs)

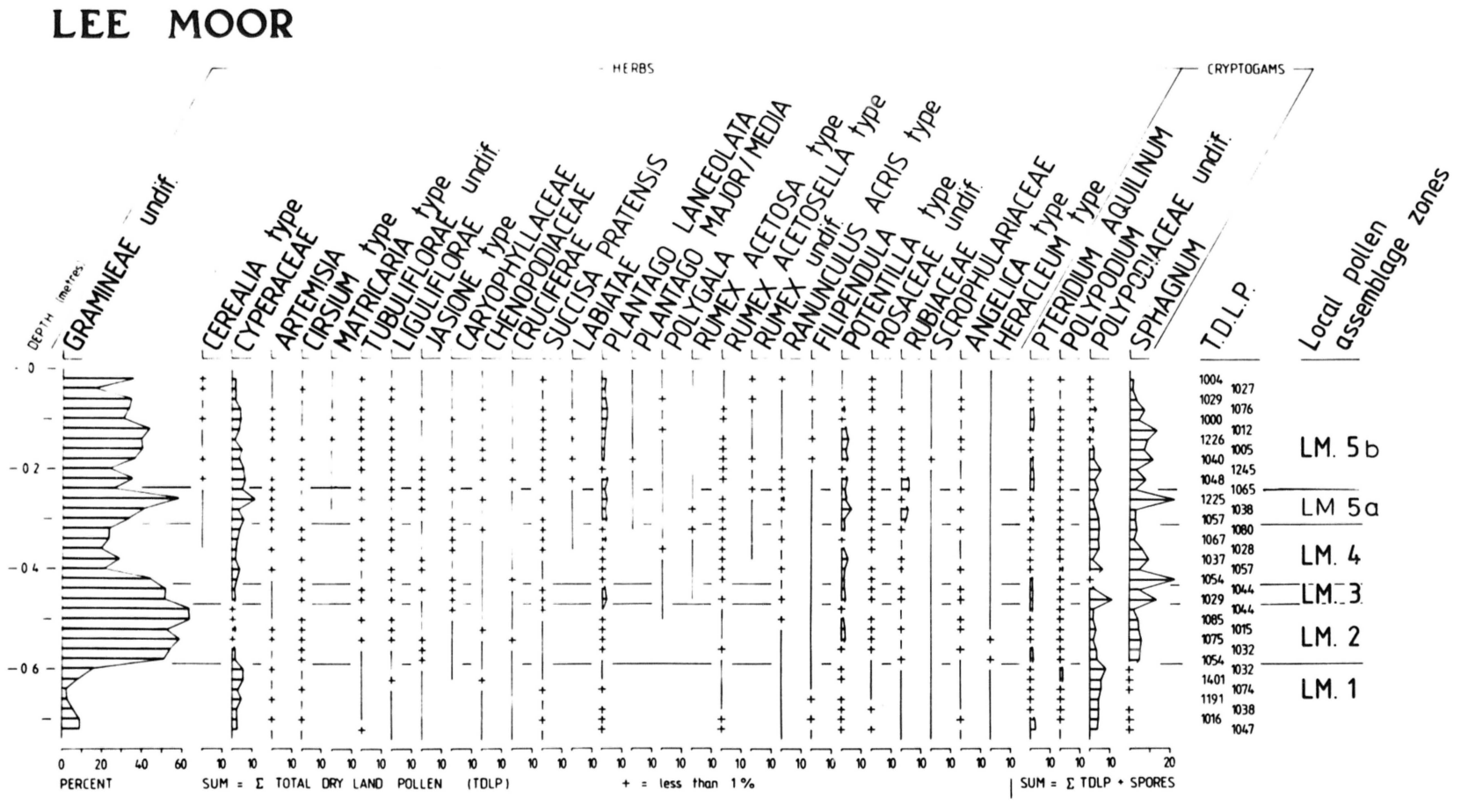


Table 3: Pollen count data, 15-157

TAXA \ DEPTH	0-2	4-6	8-10	12-14	16-18	20-22	22-24	24-26	26-28	28-30
Betula	3			1	3	1	1			
Pinus	2	2								
Ulmus				1						
Quercus	3	3	2	5	3	4		1	3	1
Tilia cordata										
Alnus	7		4	6	9	8	20	17	13	18
Fagus	1	1			1					
Fraxinus	2	1					2			1
Corylus	20	1	5	13	24	56	66	50	56	46
Salix		1						1	1	
Hedera										
Ilex	1	1								
Calluna	129	204	134	240	113	63	67	22	7	5
Ericaceae undiff.	5		2	4			3	1		
Gramineae	259	156	133	220	383	239	368	261	356	318
Cerealia										
Cyperaceae	3	2	4	4					1	3
Anthemis type										
Artemisia										
Bidens type	1	2	2	2	4	3	3	3	3	3
Centaurea nigra type										
Cirsium				1	3	1	2			1
Serratula type										
Liguliflorae	4	2	3	10	32	19	19	7	7	6
Caryophyllaceae undif.							1	4	3	2
Dianthus type										
Lychnis type										
Scleranthus										
Spergula type										
Stellaria holostea										
Jasione	1	1		1	8	5	16	5	9	15
Chenopodiaceae										
Sinapis type										
Prunella type										
Stachys type										
Lotus type										
Ulex type										
Vicia cracca type										
Liliaceae										
Plantago lanceolata	9	6	6	11	22	5	8	5	7	11
P. major										
Polygala										
Potentilla	50	42	40	46	34	10	11	5	5	5
Rosaceae undiff.		9	11	27	6	3	2			
Ranunculaceae	6	1			2					1
Galium type	3		10	20	9	3	6			
Rumex acetosa	1	1	4	2		1				
Rumex undiff.		1						1		
Saxifraga nivalis										
Succisa	1	1		1	1	1				1
Scrophulariaceae						4				
Umbelliferae				1			1			
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium	3				4	2	3	4	9	7
Pteridium	5	7	3	8	4	9	12	4	2	5
Filicales undiff.	1	1	2	4	9	1	17	21	56	60
Sphagnum	1			1	1	1	2	2		
TOTALS	524	454	370	628	686	443	632	417	540	511
FREQUENCY (x1000 Grains/gm)	1515	1970	4817	5451	5954	1922	1114	735	635	450

TAXA \ DEPTH	30-32	32-34	34-36	36-38	38-39	39-40					
Betula	1										
Pinus											
Ulmus											
Quercus	1	3		6	4	5					
Tilia cordata											
Alnus	25	10	30	42	46	47					
Fagus											
Fraxinus											
Corylus	48	32	18	60	60	30					
Salix											
Hedera											
Ilex											
Calluna	18	12	6	2		5					
Ericaceae undiff.											
Gramineae	372	240	326	272	258	198					
Cerealia											
Cyperaceae											
Anthemis type											
Artemisia											
Bidens type	1	2									
Centaurea nigra type											
Cirsium	1										
Serratula type											
Liguliflorae	4	4	4	6	6	4					
Caryophyllaceae undif.	3		4			5					
Dianthus type											
Lychnis type											
Scleranthus											
Spergula type											
Stellaria holostea											
Jasione	13	6	2								
Chenopodiaceae											
Sinapis type											
Prunella type											
Stachys type											
Leguminoseae undiff.					6						
Ulex type											
Vicia cracca type											
Liliaceae											
Plantago lanceolata	17	19	26	30	24	18					
P. major											
Polygala											
Potentilla	2					1					
Rosaceae undiff.		1									
Ranunculaceae	2		2	4	2	2					
Galium type											
Rumex acetosa											
Rumex undiff.											
Saxifraga nivalis											
Succisa	1				2						
Scrophulariaceae											
Umbelliferae											
Urtica											
Umbilicus											
cf. Hippuris											
Polypodium	23	11	30	26	34	30					
Pteridium	7	7	2		14	1					
Filicales undiff.	66	39	40	40	34	11					
Sphagnum			2	2							
TOTALS	607	386	494	490	492	357					
x1000 FREQUENCY(Grains/gm)	356	170	109	70	124	90					

Table 4: Pollen count data, 208-1002

TAXA \ DEPTH	0-5	10-15	15-20	20-22	24-26	28-29	29-30	31-32	32-33	33-34
Betula	22	3	2	1	1	1	3	3	2	2
Pinus	2				1	1				
Ulmus	2	1				4	2	3	4	1
Quercus	4	4	8	21	6	13	9	15	15	24
Tilia cordata						1				2
Alnus	2	15	30	42	28	57	69	45	56	57
Fagus	2									
Fraxinus		1		1	1	1	2	1	1	2
Corylus	14	47	85	144	119	173	178	266	214	253
Salix		1								
Hedera										
Ilex										
Calluna	186	196	86	58	37	16	12	11	5	10
Ericaceae undiff.	8	7	1	3			1			1
Gramineae	232	306	232	346	268	301	281	279	200	234
Cerealia										
Cyperaceae	6	6	2	2	9	4	1	6	4	4
Anthemis type										
Artemisia					1					
Bidens type	4								1	
Centaurea nigra type		1		2		3	1	5	1	1
Cirsium				2	1		1	2	1	
Serratula type		2								
Liguliflorae	2	13	10	9	9	3	4	1	1	1
Caryophyllaceae undif.			1							
Dianthus type										
Lychnis type								1		
Scleranthus									1	
Spergula type										
Stellaria holostea										
Jasione		2	3	2	2		2		2	3
Chenopodiaceae										
Sinapis type										
Prunella type										
Stachys type										
Leguminosae undiff.	2							1		
Ulex type										
Vicia cracca type										
Liliaceae										
Plantago lanceolata	12	8	4	8	9	6	4	5	3	3
P. major			1							
Polygala										
Potentilla	18	35	4	9	3					1
Rosaceae undiff.	8		2	4	6	6	3	2	3	6
Ranunculaceae	4			1			2	2	1	
Galium type	4	22	6		3					
Rumex acetosa	4	1								
Rumex undiff.										
Saxifraga nivalis								2		
Succisa			2	4	3	4	3	4	2	4
Scrophulariaceae										
Umbelliferae							1	2		1
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium	2	3	6	2	6	13	4	11	15	8
Pteridium	2	16	18	15	33	27	26	15	54	48
Filicales undiff.	4	2	5	15	16	16	17	15	23	32
Sphagnum		1	1	2	2	4	3	8	15	16
TOTALS	546	695	510	690	565	654	629	705	624	713
FREQUENCY(Grains/gm) x1000	786	1601	1195	1590	650	753	724	609	718	958

DEPTH / TAXA	35-36	36-37	38-39	40-41	42-43	44-45	47-48	48-49	49-50	52-53
Betula	2	4	2	2	2	1	8	2	7	7
Pinus		2		1	2	1	1	2	1	2
Ulmus	4	4		1	2	2	7	4	9	7
Quercus	16	14	28	2	17	12	9	14	16	11
Tilia cordata		2				1	2		1	
Alnus	25	46	52	10	2	54	111	24	8	2
Fagus										
Fraxinus		2		1		1				
Corylus	144	196	191	245	332	178	148	196	256	230
Salix		2								
Hedera										
Ilex										
Calluna	7	8	17	5		10	1	6	14	7
Ericaceae undiff.										
Gramineae	164	161	223	162	125	158	266	252	287	225
Cerealia										
Cyperaceae			3		2	6	3		4	5
Anthemis type	1									
Artemisia										
Bidens type		1		1		1				
Centaurea nigra type	2		4	1			4	2		
Cirsium						1	1	1	1	
Serratula type										
Liguliflorae		3	5			1				
Caryophyllaceae undif.										
Dianthus type										
Lychnis type	1				1		1	1		2
Scleranthus										
Spergula type										
Stellaria holostea										
Jasione						2	1			
Chenopodiaceae			1							
Sinapis type										
Prunella type										
Stachys type					1					
Lotus type	1									
Leguminoseae undiff.						2	1	2	1	
Vicia cracca type										
Liliaceae										
Plantago lanceolata		5	6	3	1	5	2	2	1	1
P. major			1			1				
Polygala										
Potentilla		2				1	1	2	1	6
Rosaceae undiff.	4	2	2	6	1	1	1	2	3	7
Ranunculaceae										
Galium type	1							1		
Rumex acetosa										
Rumex undiff.										
Saxifraga nivalis										
Succisa	8	2	3	5	3	4	2	8	12	15
Scrophulariaceae										
Umbelliferae							1			
Urtica						1				
Umbilicus										
cf. Hippuris										
Polypodium	4	17	6	22	31	7	9	18	11	13
Pteridium	18	22	43	20	23	51	24	50	68	82
Filicales undiff.	4	27	32	28	51	9	16	18	17	24
Sphagnum	4	13	11			4	1	2	2	1
TOTALS	409	535	630	517	596	512	621	602	719	647
FREQUENCY (Grains/gm x1000)	1884	462	2903	595	915	3539	3219	3120	2485	1118

TAXA \ DEPTH	54-56
Betula	
Pinus	
Ulmus	2
Quercus	14
Tilia cordata	2
Alnus	2
Fagus	
Fraxinus	
Corylus	146
Salix	
Hedera	
Ilex	
Calluna	
Ericaceae undiff.	
Gramineae	118
Cerealia	
Cyperaceae	
Anthemis type	
Artemisia	
Bidens type	
Centaurea nigra type	
Cirsium	
Serratula type	
Liguliflorae	
Caryophyllaceae undif.	
Dianthus type	
Lychnis type	2
Scleranthus	
Spergula type	
Stellaria holostea	
Jasione	
Chenopodiaceae	
Sinapis type	
Prunella type	
Stachys type	
Lotus type	
Ulex type	
Vicia cracca type	
Liliaceae	
Plantago lanceolata	
P. major	
Polygala	
Potentilla	
Rosaceae undiff.	
Ranunculaceae	
Galium type	
Rumex acetosa	
Rumex undiff.	
Saxifraga nivalis	
Succisa	6
Scrophulariaceae	
Umbelliferae	
Urtica	
Umbilicus	
cf. Hippuris	
Polypodium	18
Pteridium	78
Filicales undiff.	60
Sphagnum	
TOTALS	448
FREQUENCY(Grains/gm x1000)	129

Table 5: Pollen count data, 208-1003

TAXA \ DEPTH	15-20	26-28	38-40	44-45	46-47	48-49	50-51	52-53	54-55		
Betula	3	3			2		1				
Pinus											
Ulmus							1				
Quercus	1	4	9	8	6	14	17	6	6		
Tilia cordata			1			2	1				
Alnus	17	15	51	47	39	70	49	36	20		
Fagus											
Fraxinus	1	1							4		
Corylus	57	50	151	207	199	311	147	112	112		
Salix											
Hedera											
Ilex											
Calluna	198	56	92	64	59	51	39	42	32		
Ericaceae undiff.	1			1							
Gramineae	209	206	269	179	102	143	162	280	164		
Cerealia											
Cyperaceae	3	3	2	1		1	1				
Anthemis type	1		1			1					
Artemisia			2								
Bidens type	3	3			1						
Centaurea nigra type											
Cirsium					2						
Serratula type				1							
Liguliflorae	12	17	18	5	5	6	6	6	4		
Caryophyllaceae undif.											
Dianthus type											
Lychnis type											
Scleranthus											
Spergula type											
Stellaria holostea						1					
Jasione	2	2		1	1			8	4		
Chenopodiaceae	1										
Sinapis type											
Prunella type											
Stachys type											
Lotus type											
Ulex type			2								
Vicia cracca type											
Liliaceae											
Plantago lanceolata	4	5	13	2	2	3	1	10			
P. major											
Polygala											
Potentilla	1	1	2	1	1		1				
Rosaceae undiff.	3	9	4	5	1		4	16	16		
Ranunculaceae		1	1								
Galium type	7	2									
Rumex acetosa											
Rumex undiff.											
Saxifraga nivalis											
Succisa			2		1	1	4				
Scrophulariaceae											
Umbelliferae											
Urtica								2			
Umbilicus											
cf. Hippuris											
Polypodium			6	8	10	15	9	94	168		
Pteridium	7	8	44	27	31	25	14	24	24		
Filicales undiff.	3	2	12	10	13	15	5	24	36		
Sphagnum				1							
TOTALS	534	388	682	567	475	659	465	660	590		
x1000 FREQUENCY(Grains/gm)	2460	1644	187	129	1619	1159	273	28	23		

Table 6: Pollen count data, 208-1011

TAXA \ DEPTH	0-5	10-15	28-30	48-50	52-53	54-55	56-57	58-59	61-62	62-63
Betula	6	4	2	2	2	1		1	2	3
Pinus				2					1	
Ulmus	5		1				2	2	1	1
Quercus	5	2	4	14	4	10	9	10	19	16
Tilia cordata		1				2	1		1	
Alnus	4	24	20	32	24	20	35	54	48	66
Fagus										
Fraxinus			1					1	1	1
Corylus	11	83	140	102	162	139	143	208	198	241
Salix										
Hedera										
Ilex										
Calluna	241	192	25	6	2	9	10	20	11	15
Ericaceae undiff.	10	3							2	
Gramineae	147	216	164	324	202	220	211	293	257	272
Cerealia										
Cyperaceae	1	1	1	4	2	1		2	1	7
Anthemis type		1		2	2	1				4
Artemisia										
Bidens type			1							
Centaurea nigra type			1		2		2	5	3	8
Cirsium										
Serratula type			1	2						
Liguliflorae	1	29	4	2		1	3	2	4	2
Caryophyllaceae undif.										
Dianthus type										
Lychnis type						1	1		2	
Scleranthus										
Spergula type			1							
Stellaria holostea										
Jasione		2						1		
Chenopodiaceae										
Sinapis type										
Prunella type										
Stachys type									2	
Leguminosae undiff.					2		2	1		
Ulex type						2		1		
Vicia cracca type	2						2			
Liliaceae										
Plantago lanceolata	11	6	1	2	4	2	4	6	1	4
P. major										
Polygala										
Potentilla	1	5		4			2		1	
Rosaceae undiff.	1	5	2		2	1		1	2	4
Ranunculaceae							1		1	
Galium type										
Rumex acetosa										
Rumex undiff.										
Saxifraga nivalis	1			2						
Succisa		1	2		4	1	4	3	4	6
Scrophulariaceae										
Umbelliferae	2									
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium	1	4	15	6	26	21	8	16	15	22
Pteridium		9	14	12	8	22	19	24	20	23
Filicales undiff.	4	3	32	54	52	23	10	8	7	16
Sphagnum		1						2	1	2
TOTALS	455	592	433	570	500	479	469	660	604	713
FREQUENCY (Grains/gm) x1000	546	2754	249	127	70	412	746	879	2418	612

TAXA \ DEPTH	65-66
Betula	
Pinus	1
Ulmus	1
Quercus	3
Tilia cordata	
Alnus	4
Fagus	
Fraxinus	
Corylus	142
Salix	
Hedera	
Ilex	
Calluna	3
Ericaceae undiff.	
Gramineae	99
Cerealia	
Cyperaceae	3
Anthemis type	
Artemisia	
Bidens type	
Centaurea nigra type	1
Cirsium	
Serratula type	
Liguliflorae	
Caryophyllaceae undif.	
Dianthus type	
Lychnis type	
Scleranthus	
Spergula type	
Stellaria holostea	
Jasione	
Chenopodiaceae	
Sinapis type	
Prunella type	
Stachys type	
Lotus type	
Ulex type	
Vicia cracca type	
Liliaceae	
Plantago lanceolata	
P. major	
Polygala	
Potentilla	
Rosaceae undiff.	1
Ranunculaceae	
Galium type	
Rumex acetosa	
Rumex undiff.	
Saxifraga nivalis	
Succisa	7
Scrophulariaceae	
Umbelliferae	
Urtica	
Umbilicus	
cf. Hippuris	
Polypodium	39
Pteridium	20
Filicales undiff.	55
Sphagnum	
TOTALS	379
FREQUENCY(Grains/gm) x1000	114

Table 7: Pollen count data, 208-1014

TAXA \ DEPTH	0-5	10-15	20-25	34-36	36-38	41-42	43-44	45-46	47-48	49-50
Betula	2	1	5	3	4	3	9	2	6	8
Pinus	1		1	1	1	1		2		2
Ulmus	1	2	3	6	2		2	6	8	5
Quercus	8	15	17	34	30	10	34	28	47	26
Tilia cordata				2				1	2	2
Alnus	9	34	59	95	46	52	38	74	57	70
Fagus										
Fraxinus			1	3						1
Corylus	52	117	156	184	126	149	145	134	150	124
Salix					1					
Hedera										
Ilex										
Calluna	170	68	12	20	12	10	9	9	11	7
Ericaceae undiff.	14	1	1	1						
Gramineae	113	212	271	412	253	201	206	230	329	291
Cerealia				3					6	
Cyperaceae	7	4	4	21	9	2	6	3	20	25
Anthemis type									1	
Artemisia										
Bidens type					1	1			1	
Centaurea nigra type		2			1	3			1	2
Cirsium										
Serratula type										
Liguliflorae	2	5	1	2	2	2		2		
Caryophyllaceae undif.										
Dianthus type										
Lychnis type	2	1			1			1		
Scleranthus									1	
Spergula type										2
Stellaria holostea										
Jasione					1					
Chenopodiaceae	1		1							
Sinapis type	1									
Prunella type										
Stachys type										
Leguminoseae undiff.										2
Ulex type	1									
Vicia cracca type										
Liliaceae										
Plantago lanceolata	5	4	3	3	1	5	1	2	3	5
P. major										
Polygala										
Potentilla	1	1		4	7	1	4	4	3	
Rosaceae undiff.		3	3	8	6	2	10	6	9	10
Ranunculaceae										
Galium type	4		1							
Rumex acetosa	1	1	1							
Rumex undiff.							1			1
Saxifraga nivalis										
Succisa		1	1		1	4	2		3	
Scrophulariaceae										
Umbelliferae						1				2
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium		1	3	5	2	7		2	3	2
Pteridium	1	6	15	20	11	37	7	3	5	12
Filicales undiff.	6	5	7	8	4	14	5	5	3	11
Sphagnum	4	5	17	19	10	8	13	20	16	13
TOTALS	402	484	566	855	534	505	479	513	724	612
FREQUENCY (x1000 Grains/gm)	1710	2466	2460	2072	312	868	4537	7133	4631	369

TAXA \ DEPTH	51-52	53-54	55-56	58-60							
Betula		1	2	2							
Pinus	4		1	5							
Ulmus	4	3	2	2							
Quercus	6	27	25	21							
Tilia cordata											
Alnus	3	2	10	2							
Fagus											
Fraxinus											
Corylus	157	245	269	177							
Salix		2	2	2							
Hedera											
Ilex											
Calluna	1										
Ericaceae undiff.											
Gramineae	231	129	224	167							
Cerealia											
Cyperaceae	3	3	7	9							
Anthemis type			1	1							
Artemisia											
Bidens type			1								
Centaurea nigra type											
Cirsium											
Serratula type											
Liguliflorae											
Caryophyllaceae undif.											
Dianthus type											
Lychnis type											
Scleranthus											
Spergula type											
Stellaria holostea											
Jasione											
Chenopodiaceae											
Sinapis type											
Prunella type											
Stachys type											
Lotus type											
Ulex type											
Vicia cracca type											
Liliaceae											
Plantago lanceolata											
P. major											
Polygala											
Potentilla		1	2								
Rosaceae undiff.	1			1							
Ranunculaceae											
Galium type				1							
Rumex acetosa											
Rumex undiff.											
Saxifraga nivalis											
Succisa		1		1							
Scrophulariaceae											
Umbelliferae											
Urtica											
Umbilicus											
cf. Hippuris				1							
Polypodium	1	3	4								
Pteridium	21	2	2	1							
Filicales undiff.	40	30	31	11							
Sphagnum	5	16	8	11							
TOTALS	472	449	583	404							
FREQUENCY (Grains/gm) x1000	239	547	118	53							

Table 8: Pollen count data, 208-1018

TAXA \ DEPTH	14-16	21-22	27-28	30-31	36-40	44-45	48-49	50-51	52-53	54-55
Betula	4	1	2	2	4		2	7	7	4
Pinus		1	1	2	3	4	1	4	1	
Ulmus	1	2	1	2	2	3		1		8
Quercus	10	16	7	20	26	11	1	15	13	32
Tilia cordata	1	1			2				1	1
Alnus	74	78	83	76	98	80	18	52	101	186
Fagus										
Fraxinus	1			2	2					1
Corylus	162	161	190	118	202	116	72	109	126	188
Salix							3			2
Hedera										
Ilex										
Calluna	40	11	11	16	14	8	1	6	2	10
Ericaceae undiff.	1		1					5		
Gramineae	311	282	249	314	284	222	298	450	310	346
Cerealia										
Cyperaceae	1	1				2	6	24		6
Anthemis type	1	1			5	33	8	7	1	
Artemisia										
Bidens type	2	1	1	2	5	12	6	8	1	
Centaurea nigra type					1					1
Cirsium								1		
Serratula type							1			
Liguliflorae	9	3	3	2	1	4			1	1
Caryophyllaceae undif.										
Dianthus type										
Lychnis type				2				2		
Scleranthus	1									
Spergula type										
Stellaria holostea										
Jasione										1
Chenopodiaceae										
Sinapis type										
Prunella type										
Stachys type								2		
Leguminoseae undiff.			2			1		1		
Ulex type										
Vicia cracca type										
Liliaceae										
Plantago lanceolata	6		3	2	1			2	2	1
P. major								1		
Polygala										
Potentilla		3	2	2	3	2	1	1	4	5
Rosaceae undiff.	3	5	4	2	4	3		4	5	7
Ranunculaceae									1	2
Galium type										
Rumex acetosa		2							1	
Rumex undiff.										
Saxifraga nivalis										
Succisa	2	2							4	1
Scrophulariaceae										
Umbelliferae										
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium	4	1	2	2		2		1	2	3
Pteridium	9	11	15	20	3		2	6	10	15
Filicales undiff.	16	9	2	4	10	5	8	16	16	13
Sphagnum	7	14	9	10	2	3	3	3	10	15
TOTALS	668	592	588	600	672	508	428	729	617	850
FREQUENCY ($\times 1000$/cm)	995	648	1306	15	420	957	132	455	2566	2380

TAXA \ DEPTH	56-57	58-59	60-61	63-64	66-68	70-72					
Betula	6	5	2	6	14	2					
Pinus	1	1		1	5	1					
Ulmus	1	1	7	3	1						
Quercus	33	28	22	5	5	2					
Tilia cordata		1									
Alnus	52	110	106	4		2					
Fagus											
Fraxinus	1										
Corylus	172	139	117	262	209	76					
Salix					7	1					
Hedera											
Ilex		1									
Calluna	12	6	2	1	16	25					
Ericaceae undiff.											
Gramineae	247	220	253	90	244	388					
Cerealia											
Cyperaceae	14	2	3		1						
Anthemis type	1				5	3					
Artemisia	1					1					
Bidens type					6	5					
Centaurea nigra type		1	1								
Cirsium											
Serratula type											
Liguliflorae	1	1	1			13					
Caryophyllaceae undif.											
Dianthus type											
Lychnis type	1	1			2						
Scleranthus						1					
Spergula type											
Stellaria holostea											
Jasione											
Chenopodiaceae						1					
Sinapis type											
Prunella type											
Stachys type											
Leguminoseae undiff.		1									
Ulex type											
Vicia cracca type											
Liliaceae											
Plantago lanceolata	3	1	1	1							
P. major											
Polygala											
Potentilla	2	1	2								
Rosaceae undiff.	16	6	8		1						
Ranunculaceae											
Galium type											
Rumex acetosa											
Rumex undiff.											
Saxifraga nivalis											
Succisa	2	1				1					
Scrophulariaceae											
Umbelliferae		1									
Urtica											
Umbilicus					1						
cf. Hippuris											
Polypodium	4	3	3	4		1					
Pteridium	20	6	16	2		2					
Filicales undiff.	3	5	16	35	52	33					
Sphagnum	27	10	14	5	6	1					
TOTALS	592	539	574	413	570	559					
FREQUENCY(Grains/gm)	8837	3998	1864	403	686	26					

TAXA \ DEPTH	1	2	3	4	6	8	10	12	14	16
Betula	4									
Pinus							1			
Ulmus										
Quercus	7	1	2	2	4	2	1		1	
Tilia cordata						1				
Alnus	97	78	119	138	120	195	209	244	170	252
Fagus										
Fraxinus			2	2			1			2
Corylus	126	92	98	86	42	36	31	36	29	56
Salix										4
Hedera										
Ilex										
Calluna	51	26	18	16	5	1		1	1	
Ericaceae undiff.	1									
Gramineae	192	178	194	222	148	146	155	130	131	232
Cerealia										
Cyperaceae	11	2	1	1	5		1		3	6
Anthemis type										
Artemisia										
Bidens type		2	1		1					
Centaurea nigra type										
Cirsium			2							
Serratula type										
Liguliflorae	6	6	3	4	2	3	2	1	3	4
Caryophyllaceae undif.	1							2	1	
Dianthus type	1									
Lychnis type		2								
Scleranthus										
Spergula type										
Stellaria holostea										
Jasione	3	4		4	2		6	2		
Chenopodiaceae										
Sinapis type	1									
Prunella type										
Stachys type										
Leguminosae undiff.	2									
Ulex type										
Vicia cracca type										
Liliaceae										
Plantago lanceolata	10	12	14	10	4	5	2		1	2
P. major										
Polygala										
Potentilla	5	2	4			1		2		2
Rosaceae undiff.	2		1							
Ranunculaceae	2	1	1	2						
Galium type										
Rumex acetosa	2									
Rumex undiff.										
Saxifraga nivalis										
Succisa	2		1		1				1	
Scrophulariaceae	3									
Umbelliferae				1						
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium	3	6	3	2	1	5	3	6	3	4
Pteridium	28	28	35	36	31	27	65	110	55	116
Filicales undiff.	23	18	21	26	14	4	22	32	1	
Sphagnum	27	14	9		2					
TOTALS	579	476	522	550	381	427	500	564	400	680
x1000 FREQUENCY(Grains/gm)	973	1200	877	924	1756	1435	1152	980	896	508

DEPTH / TAXA	19	22
Betula		
Pinus		
Ulmus		
Quercus	3	
Tilia cordata		
Alnus	156	118
Fagus		
Fraxinus		
Corylus	36	40
Salix		
Hedera		
Ilex		
Calluna		
Ericaceae undiff.		
Gramineae	174	132
Cerealia		
Cyperaceae		2
Anthemis type		
Artemisia		
Bidens type		
Centaurea nigra type		
Cirsium		
Serratula type		
Liguliflorae		4
Caryophyllaceae undif.		
Dianthus type		
Lychnis type		
Scleranthus		
Spergula type		
Stellaria holostea		
Jasione		
Chenopodiaceae		
Sinapis type		
Prunella type		
Stachys type		
Lotus type		
Ulex type		
Vicia cracca type		
Liliaceae		
Plantago lanceolata	3	2
P. major		
Polygala		
Potentilla		2
Rosaceae undiff.		
Ranunculaceae		
Galium type		
Rumex acetosa		
Rumex undiff.		
Saxifraga nivalis		
Succisa		
Scrophulariaceae		
Umbelliferae		
Urtica		
Umbilicus		
cf. Hippuris		
Polypodium	6	2
Pteridium	66	28
Filicales undiff.	6	24
Sphagnum		
TOTALS	450	354
FREQUENCY (x 1000/Grains/gm)	112	74

Table 10: Pollen count data, 208-2002

TAXA \ DEPTH	1	3	5	7	8	10	13	16	18	21
Betula	6	4	4	1	1	10	6	4	10	2
Pinus	2	4	2	1	1		1		2	
Ulmus	2	1	2		2	2		1	2	
Quercus	14	8	6	14	10	4	20	14	6	16
Tilia cordata									2	
Alnus	20	46	22	43	53	44	48	55	42	146
Fagus										
Fraxinus	2		4		2	2			1	2
Corylus	4	26	32	33	34	24	38	61	92	135
Salix	1							1	1	
Hedera					1					
Ilex										
Calluna	34	205	108	120	161	192	235	106	85	68
Ericaceae undiff.	4	6	2	7	8	2	3			
Gramineae	284	303	251	170	156	161	170	209	260	275
Cerealia		1	6	2			2			
Cyperaceae		8	35	14	51	10	14	10	8	6
Anthemis type		4				1				
Artemisia										
Bidens type	20	2		1	4	1		4		
Centaurea nigra type										
Cirsium						1	1			1
Serratula type										
Liguliflorae	15	10	12	1	10	6	5	6	17	10
Caryophyllaceae undif.										
Dianthus type										
Lychnis type			1							
Scleranthus										
Spergula type										
Stellaria holostea				2	1		1			
Jasione	1							4	2	2
Chenopodiaceae	2								1	
Sinapis type	2	1				1	1			
Prunella type								1		
Stachys type					2		1			
Lotus type		1	3	2						
Ulex type										
Vicia cracca type										
Liliaceae									1	
Plantago lanceolata	4	25	20	21	16	12	15	10	24	35
P. major										
Polygala										
Potentilla	4	24	21	17	16	16	29	14	14	17
Rosaceae undiff.	2	7	2		11					
Ranunculaceae	6	1	1							2
Galium type	11	8	5	4	1	4	5		2	
Rumex acetosa					1					
Rumex undiff.					1					
Saxifraga nivalis										
Succisa				2		1	1	4	7	4
Scrophulariaceae										
Umbelliferae				1						
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium			2	3	1	1	4	7	8	15
Pteridium	65	20	28	25	22	20	17	42	37	88
Filicales undiff.		7	4	7	5		4	11	10	15
Sphagnum		4	11	15	10	10	15		41	12
TOTALS	505	731	573	491	571	515	621	564	634	839
X 1000 FREQUENCY(Grains/gm)	688	2049	1624	1383	1550	1414	1747	1590	901	1190

TAXA \ DEPTH	22	23	25	26	28	30	32	34	36	38
Betula	3	1	3	1	1		1			
Pinus	1							1		
Ulmus	1		1		2	2	1	1	1	1
Quercus	12	17	7	4	9	2	1	3	1	2
Tilia cordata		2						1	1	1
Alnus	62	130	60	67	114	161	143	264	152	110
Fagus										
Fraxinus	3	6	1		1		1	1		
Corylus	63	157	72	76	61	44	28	59	45	21
Salix										
Hedera										
Ilex										
Calluna	9	36	18	13	9	2	1	3	1	
Ericaceae undiff.								1		
Gramineae	137	208	123	71	136	145	101	158	95	71
Cerealia										
Cyperaceae	7	13	3	1	12	4	5	11		
Anthemis type						2				
Artemisia										
Bidens type										
Centaurea nigra type					1					
Cirsium	1		1	1						
Serratula type										
Liguliflorae	3	10	4	10	1	1	2	5	2	3
Caryophyllaceae undif.										
Dianthus type										
Lychnis type									1	
Scleranthus			1							
Spergula type										
Stellaria holostea	1		1	1				1		
Jasione	3	8	2	1	3		1	1	1	
Hornungia type							1			
Sinapis type				2				2		
Prunella type										
Leguminosae undiff.			1							
Lotus type						2	1			
Ulex type							1		1	1
Trifolium type			2							
Liliaceae										
Plantago lanceolata	15	15	6	13	12		2	3		1
P. major										
Polygala										
Potentilla	8	5	3	1	3		1	1	1	1
Rosaceae undiff.			1	2		4		1	1	
Ranunculaceae	1	5			1	1				
Galium type						2	1			
Rumex acetosa							1			
Rumex undiff.										
Saxifraga nivalis										
Succisa	1	2	2	1	2			1		
Scrophulariaceae										
Umbelliferae										
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium	6	12	21	10	8	2	1	3	2	3
Pteridium	33	78	66	42	55	74	49	73	58	35
Filicales undiff.	8	26	47	39	106	4	8	19		
Sphagnum	5	10	6	10	4					
TOTALS	378	743	453	358	540	452	351	617	364	250
x 1000 FREQUENCY(Grains/gm)	1058	1040	2087	1165	3104	510	4769	2004	1209	1394

Table 10: cont.

TAXA \ DEPTH	40	42
Betula		1
Pinus		1
Ulmus		1
Quercus		1
Tilia cordata		
Alrus	95	169
Fagus		
Fraxinus		
Corylus	29	45
Salix		
Hedera		
Ilex		
Calluna		1
Ericaceae undiff.		
Gramineae	71	124
Cerealia		
Cyperaceae		2
Anthemis type		
Artemisia		
Bidens type		
Centaurea nigra type		
Cirsium		
Serratula type		
Liguliflorae		2
Caryophyllaceae undif.		
Dianthus type		
Lychnis type		
Scleranthus		
Spergula type		
Stellaria holostea		1
Jasione		
Chenopodiaceae		
Sinapis type		
Prunella type		
Stachys type		
Lotus type		
Ulex type		
Vicia cracca type		
Liliaceae		1
Plantago lanceolata		2
P. major		
Polygala		
Potentilla		
Rosaceae undiff.		2
Ranunculaceae		
Galium type		
Rumex acetosa		
Rumex undiff.		
Saxifraga nivalis		
Succisa		
Scrophulariaceae		
Umbelliferae		
Urtica		
Umbilicus		
cf. Hippuris		
Polypodium	1	9
Pteridium	20	60
Filicales undiff.		23
Sphagnum		2
TOTALS	216	445
x 1000 FREQUENCY(Grains/gm)	604	150

TAXA \ DEPTH	5-7	9-11	17-19	20-21	23-24	24-25	27-28	31-32	34-35	41-43
Betula	2		2	2	3	2	1		1	
Pinus					1				1	
Ulmus					1	1				
Quercus		4	2	6	5	4	2	2	6	30
Tilia cordata								1		
Alnus	31	40	19	36	62	71	65	66	140	230
Fagus			1	1						
Fraxinus	1		1		1				2	1
Corylus	28	18	10	18	59	81	79	68	70	124
Salix		2								
Hedera										
Ilex										
Calluna	56	162	143	196	33	31	16	10	2	2
Ericaceae undiff.	2	8	3	2		1				
Gramineae	188	186	95	270	218	267	139	191	180	56
Cerealia		2				2				
Cyperaceae		22	2	2	6	5	2	6	6	
Anthemis type										
Artemisia										
Bidens type	2		1	2	2	2				
Centaurea nigra type										
Cirsium			1			1			6	
Serratula type										
Liguliflorae	2	6	1	6	2	5	4	13		
Caryophyllaceae undif.										
Dianthus type										
Lychnis type								1	1	
Scleranthus	1									
Spergula type										
Stellaria holostea					1					2
Jasione					1	1	6			
Chenopodiaceae										
Sinapis type		4								
Prunella type										
Stachys type		2								
Leguminosae undiff.		4		2			1			2
Ulex type			2							
Vicia cracca type										
Liliaceae										
Plantago lanceolata	7	14	8	16	10	9	18	30	10	
P. major							1			
Polygala		2								
Potentilla	4	8	14	6	2	4	2		2	
Rosaceae undiff.	3	20	11	12	6	8	2		2	2
Ranunculaceae					1	1	1			2
Galium type	4	2	3	4	6	3	2			
Rumex acetosa										
Rumex undiff.										
Saxifraga nivalis										
Succisa		2	1		1	1	3	1		
Scrophulariaceae										
Umbelliferae						2				
Urtica										
Umbilicus										
cf. Hippuris										
Polypodium	2			8	3	14	5	6	18	48
Pteridium	62	18	17	18	38	40	70	111	62	28
Filicales undiff.	1		2	6	7	6	10	58	24	14
Sphagnum	2		2	16	8	8	1	8		
TOTALS	400	526	348	632	477	571	430	573	530	540
FREQUENCY(Grains/gm) ×1000	1382	2272	2405	3640	3297	2960	2477	2888	458	311

DEPTH / TAXA	47-49	51-53	61-63
Betula	2		
Pinus		2	2
Ulmus			
Quercus	48	42	16
Tilia cordata			
Alnus	130	150	80
Fagus			
Fraxinus		1	
Corylus	94	109	44
Salix			
Hedera			
Ilex			
Calluna		2	
Ericaceae undiff.			
Gramineae	92	97	150
Cerealia			
Cyperaceae	4	1	
Anthemis type			
Artemisia	2		
Bidens type			
Centaurea nigra type			
Cirsium			
Serratula type			
Liguliflorae	2		
Caryophyllaceae undif.			
Dianthus type			
Lychnis type			2
Scleranthus		1	
Spergula type			
Stellaria holostea			2
Jasione			
Chenopodiaceae			
Sinapis type			2
Prunella type			
Stachys type			
Lotus type			
Ulex type			
Vicia cracca type			
Liliaceae			
Plantago lanceolata	2	1	2
P. major			
Polygala			
Potentilla		2	
Rosaceae undiff.			
Ranunculaceae			
Galium type			
Rumex acetosa			
Rumex undiff.			
Saxifraga nivalis			
Succisa			
Scrophulariaceae			
Umbelliierae			2
Urtica			
Umbilicus			
cf. Hippuris			
Polypodium	52	44	6
Pteridium	28	16	42
Filicales undiff.	42	67	34
Sphagnum		3	
TOTALS	504	540	384
FREQUENCY(Grains/gm) x1000	145	194	33

Phosphate analysis

N D Balaam and H M Porter

Analytical Method

The principal method adopted for the soil phosphate analysis for the Shaugh Moor project was a slightly modified version of that published by Dick and Tabatabai (1977). This method involves extraction of soil phosphate by alkaline oxidation with Sodium hypobromite (NaOBr-NaOh). It has been calculated that this process extracts about 60-70% of total phosphate from soils such as those on Shaugh Moor (Ralph, pers comm). This was considered satisfactory foe the purposes of this project.

It is thought that this method has not been used before in archaeological survey work but it is suggested that the simplicity of the technique and the relatively high level of phosphate extraction might prove of value in future work.

Reagents

Sodium hypobromite solution
Formic acid (90%)
Sulphuric acid (5N)
Ammonium molybdate-Antimony Potassium tartrate sol. (reagent A)
Ascorbic acid solution (Ascorbic acid dissolved in reagent A)
Deionised water

Procedure

1 sample dried and crushed to pass through a 100 mesh sieve.
2 subsample (0.2g) placed in small boiling flask.
3 3ml sodium hypobromite added and contents mixed.
4 placed in sand bath (260-280 degrees C) in fume cupboard and evaporated to dryness - then heated for a further 30 minutes.
5 flask removed from heat and allowed to cool.
6 4ml deionised water and 1ml formic acid added and mixed.
7 25ml 1N sulphuric acid added and mixed
8 Allow flask to stand for about an hour for contents to settle
9 An aliquot (1-2ml) of the clear solution transferred to flasks or tubes, 4ml of reagent B added and solution made up to 25ml with deionised water.
10 After 30 minutes the absorbance of the molybdenum blue colour formed is measured by spectrophotometer or colorimeter adjusted to a wavelength of 720nm.
11 Phosphate concentration is calculated by reference to a calibration curve plotted from results obtained from measurement of standard phosphate solutions.

Notes:

Modifications

Point 8 The original method suggests centrifuging for one minute at 12000 rpm. This was found to be impractical. There was no significant difference observed between samples which were allowed to settle for an hour and others which were centrifuged.

Point 9 Dick and Tabatabai recommend making up this solution in a 25 ml volumetric flask. This was costly in terms of glassware and time. Fixed volumes of liquids were added from automatic pippettors instead.

Sources of error

On the whole the process is simple and quick, however, it is worth noting that because of the small sample sizes involved, accuracy in measurement of sample weights is of great importance. With soil sample sizes of 0.2g an inaccuracy in weighing of as little as 0.02g will introduce a substantial error. However, despite this the method described was found to give readily reproducible results.

Speed

Following the procedure outlined above it is possible for one worker to process about 150 samples a day. This assumes that samples have been previously dried and sieved, this operation takes about another two days for each 150 samples. Thus the average rate of processing of samples is about 50 per person per day.

Sampling

Analysis of samples from soil profiles in the Shaugh Moor area showed that the highest levels of phosphate were to be found in the B horizon of the soil. However, within the B horizon (especially where an ironpan is present) the rate of increase of soil phosphate with depth is such that very different phosphate values are obtained from samples taken at slightly different depths within the same soil profile. To try to minimise sampling error samples were taken from the top few centimetres of the mineral soil Ah/Ea horizon. This point in the soil is easily recognised and can be accurately sampled. The rate of change of phosphate with depth in this horizon is comparatively low. Figure 10 shows the variation of soil phosphate with depth (the profile analysed is 15-157, from within enclosure 15, grid reference 2160E 770N).

Notes on the Phosphate surveys

Range of Phosphate values in the samples analysed

The variation of soil phosphate levels across much of the enclosure was seen to be very similar to that of the unenclosed moorland in the area. The histograms in figure 11 illustrate the range of phosphate values on the enclosure site (both including and excluding the areas of the huts) and in the area of the Shaugh Moor field system. In both the field system and the central area of the enclosure (between 770 and 780N) the mean phosphate value lies between 300 and 350 ppm. Other samples from the unenclosed areas of Shaugh Moor show similar ranges of values with means of about 330ppm.

Figure 11 also illustrates the high proportion of samples from the huts in the enclosure which have very high levels of soil phosphate. Many of the samples from the huts show phosphate levels more than four times those from the central area of the enclosure.

Shaugh Moor field system

Distribution of Phosphate values:

The areas sampled for this investigation are illustrated in figures 12 and 13. With the exception of the higher phosphate values in the area around the hut (500E/490N) there is no evidence of any significant concentrations in any part of the area surveyed. It is possible that sampling at closer intervals might have shown more readily interpretable patterns. However, the generally low phosphate values from the area suggest that it is unlikely that this would be so.

The Enclosure

Comparison of samples from Ea and Bs horizon:

Table 12 gives comparative figures for samples from Ea and Bs horizons at points at which both horizons were sampled. The results of the analyses have been quoted in terms of a ratio to a mean value as described in the printed report. It can be seen that at most points there is rough agreement between the results of the samples from the two different horizons.

Figure 10
Soil phosphate variation with depth, profile 15-157

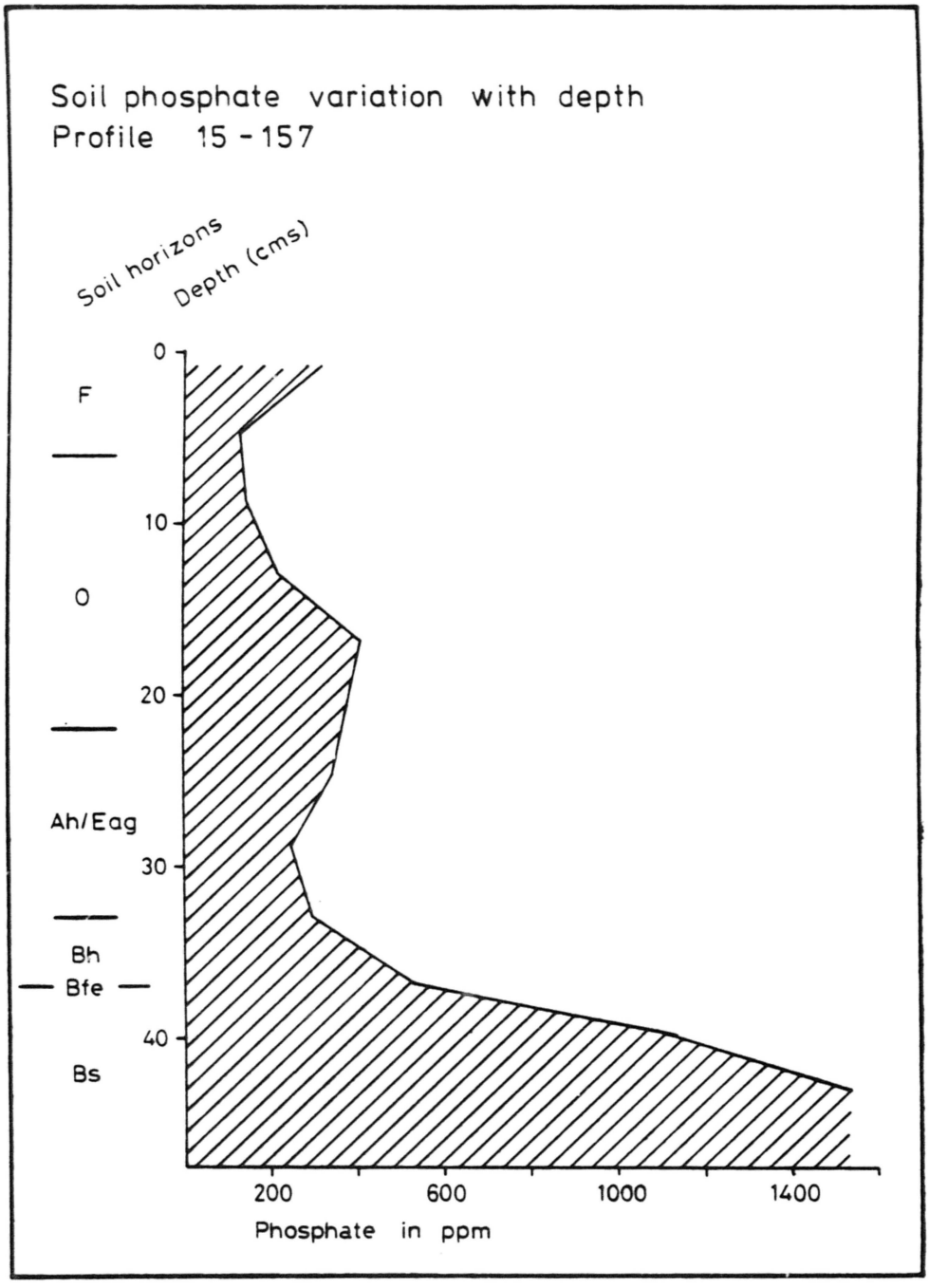


Figure 11
Histograms showing range of phosphate values from the enclosure site and the Shaugh Moor field system.

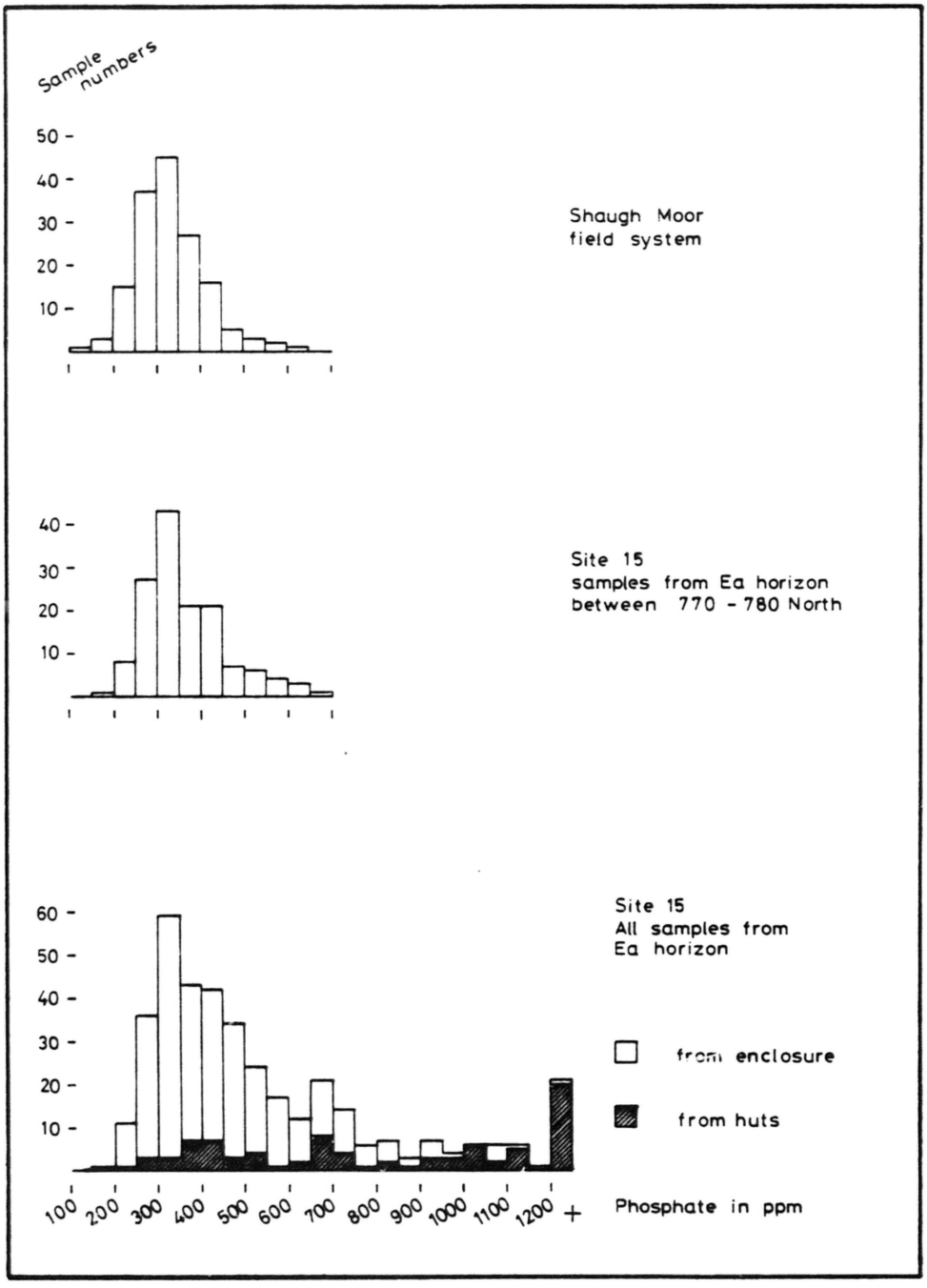


Figure 12
Area of fields sampled for phosphate analysis

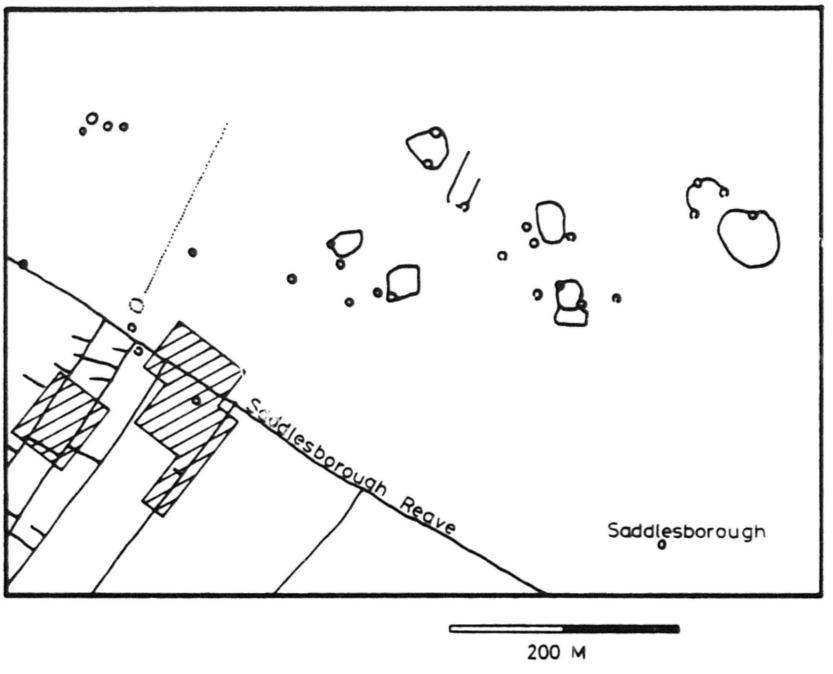


Figure 13
Results of phosphate survey of field system

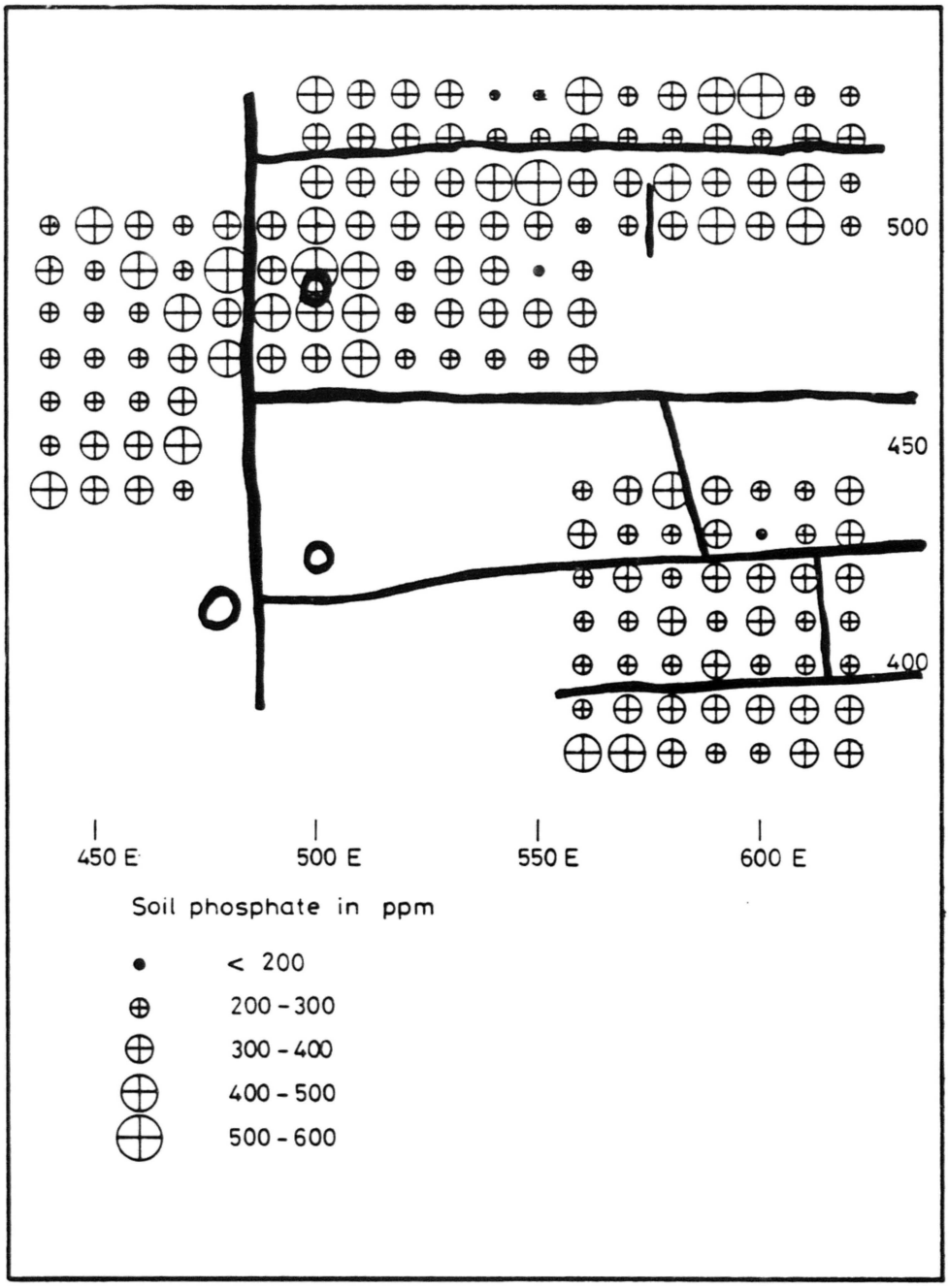


Table 12
Comparison between phosphate samples from Ea and Bs horizons of the soils within enclosure 15

COORDINATES E	N	Ea SAMPLES PHOSPHATE IN PPM	RATIO TO MEAN	Bs SAMPLES PHOSPHATE IN PPM	RATIO TO MEAN
2132	755	401	0.86	825	0.72
2138	755	386	0.82	892	0.78
2151	742	980	2.10	2130	1.86
	743	1632	3.50	5332	4.68
2152	741	2220	4.75	5640	4.94
	744	980	2.10	1695	1.48
	745	830	1.78	2790	2.44
2153	740	1508	3.23	1860	1.62
	742	2120	4.54	1635	1.43
	743	1650	3.53	2345	2.05
	744	1650	3.53	1900	1.66
	745	500	1.07	1477	1.29
2154	741	1650	3.53	2530	2.21
2155	742	1360	2.91	2512	2.12
2158	743	656	1.40	1830	1.60

The insect infestation of the wood

Maureen A Girling

The waterlogged wood from Wotter Common was examined for signs of possible insect attack. The wood from over forty samples ranged from artifacts (including the possible ard) to small branches and twigs. Probable insect attack was identified from channels visible in cross section (apparently representing galleries excavated by the larvae of wood boring insects) and holes on the surface which resemble the flight holes of the adults. In many cases the soft waterlogged wood showed signs of penetration by plant roots which produce similar channelling to insect boring. It was not always possible to identify the original cause, but plant roots had occasionally survived in the channels and were also suggested were groups ran in parallel across the rays.

The most likely cause of the insect borings are attacks by the beetle families Anobiidae and Cerambycidae. Most widespread are small galleries and flight-holes probably made by Anobium punctatum (Deg.), the woodworm or furniture beetle. One example is exposed in section in the worn surface of the possible ard (sample number 8011224). Three channels and several flight holes are visible and as one of the channels is 'V' shaped it is clearly not a rootlet hole. Wood from sample 8011217 also displays examples of woodworm attack and in this instance the channels still contained frass (the faecal material produced by the larvae). Other signs of anobiid attack are dominantly of Anobium size but at least one possible infestation of Xestobium rufovillosum (Deg.), the death-watch beetle, was noted in wood from sample 8011238.

Cerambycid borings varied from small galleries possibly attributableto Gracilia minuta (F.), seen in twigs from sample 8011220, to wider channels excavated by one of the larger longhorn beetle species.

Both Anobiidae and Cerambycidae attack living and dead wood, but Anobium and Xestobium prefer dead wood and major infestations of these beetles are usually found in structural timbers. Attacks of these species in the Wotter Common wood might have arisen in artifacts and timbers during or after their use.

A complete list of identifications of insect attack is given in the Ancient Monuments Laboratory report on the material (Girling, 1982)

Table 13

Details of all wood samples examined from Wotter Common.
Identifications by N D Balaam

Sample no.	Species	Description
8011204	Alnus	tiny twigs
8011205	Crataegus type	three fragments 17mm diameter, c15 years old
8011206	Rosa canina	17 twigs, 10-14mm diameter, rings not distinguishable
	Quercus	6 fragments, both twigs and split
8011207	Quercus	11 twigs, 5-10mm diameter, 4 years old
	Salix, Alnus, Crataegus type	7 twigs, 2-7mm diameter, 1-5 years old
8011209	Quercus	radial fragments with wide rings
8011210	Alnus	twigs, 12-18mm diameter, c9 years old
8011211	Quercus	stake
8011212	Alnus	stem, 62mm diameter, c36 years old
8011213	Quercus	split piece
8011214	Quercus	radial fragments with very narrow rings
8011216	Quercus	radial piece 60x15mm
8011217	Quercus,	three radial pieces
	Corylus,	twigs, 15mm diameter
	Crataegus type	

Table 13 (continued)

Sample No.	Species	Description
8011218	Calluna	twigs of 4 and 11mm diameter
8011219	Quercus	stake
8011220	Quercus	twigs 7mm diameter, mostly pith
	Rosa canina	twigs 5-7mm diameter
8011221	Quercus	stake
8011222	Quercus	radial piece, wide rings
8011225	Quercus	three radial fragments
8011226	Quercus	split piece
8011227	Quercus	split piece with possible sapwood
8011228	Quercus	fragment 25x18mm
8011229	Quercus	four radial fragments with very narrow rings
8011230	Quercus	three radial fragments
8011231	Quercus	small fragments
8011232	Alnus	twigs, 10mm diameter
8011233	Quercus	radial fragments
8011234	Quercus	twig, distorted
8011235	Rosa canina	twigs, distorted
8011236	Quercus	radial fragments
8011237	Quercus	radial fragments and stake
8011238	Quercus	fragment, 30x16mm, very narrow rings
8011239	Quercus	radial fragments, 17x5mm, wide rings
8011240	Quercus	twig fragments
8011241	Quercus	radial fragments, narrow rings
8011243	Quercus	fragments
8011244	Quercus	radial fragments

Plym Valley Survey: Site 213

Introduction

The figures contained within this section indicate the type and extent of bronze age occupation within the area of the Moorland Plym (figures 20-22 in the printed report are part of this set). The monuments shown on these maps are not numbered in as great a detail as on the same figures in the main Shaugh Moor Project archive, nor are they accompanied by the relevant written data. These illustrations are intended only to give an indication of the material contained within the archive, while at the same time showing detail that could not be incorporated in figures 17 and 18 in the printed report.

For a key to these figures see figures 17 and 18 of the printed report.

Figure 14
Plym Valley: Dewerstone Rock, Shaden Moor and Wigford Down

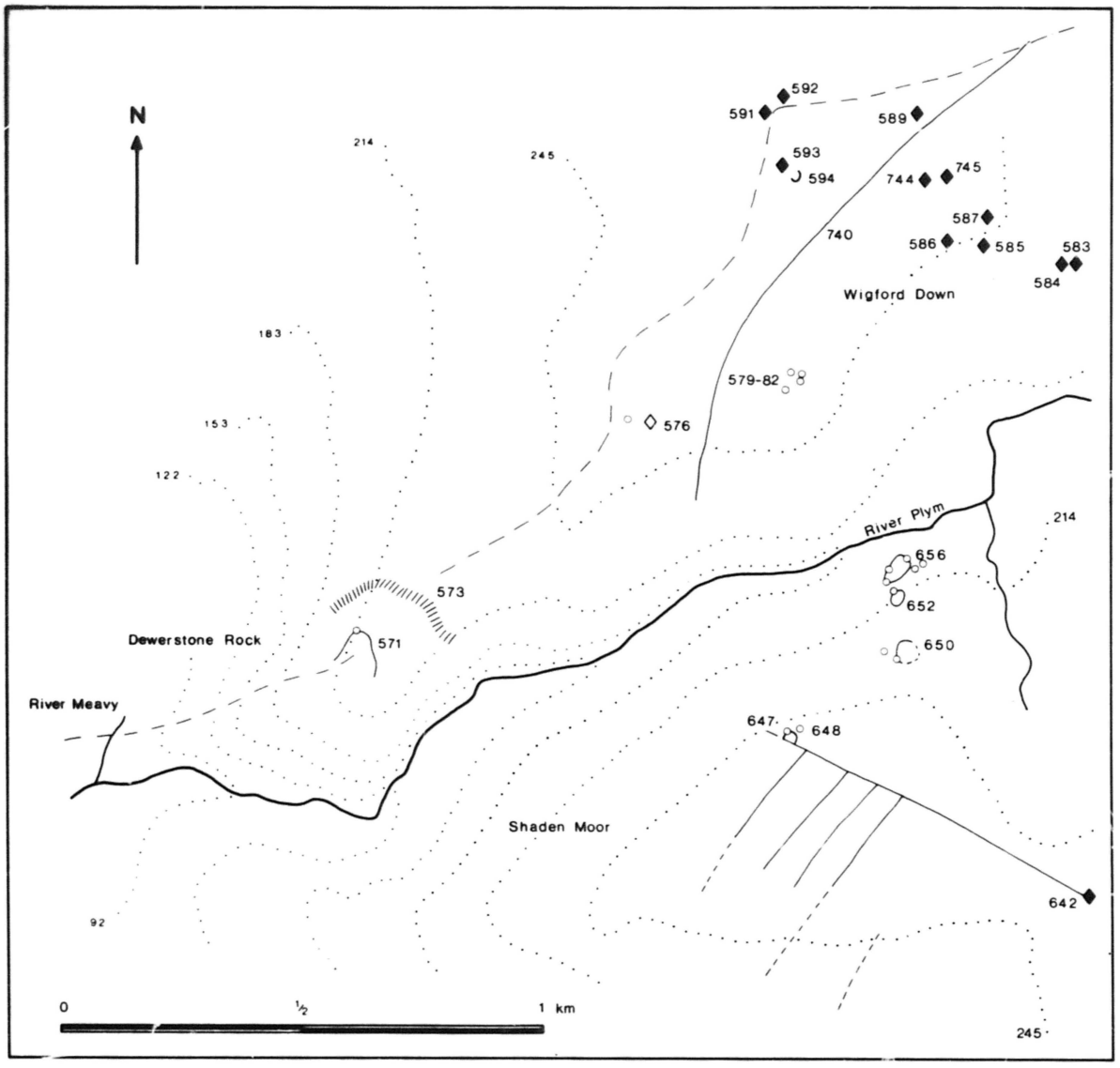


Figure 15
Plym Valley: Brisworthy and Ringmoor Down

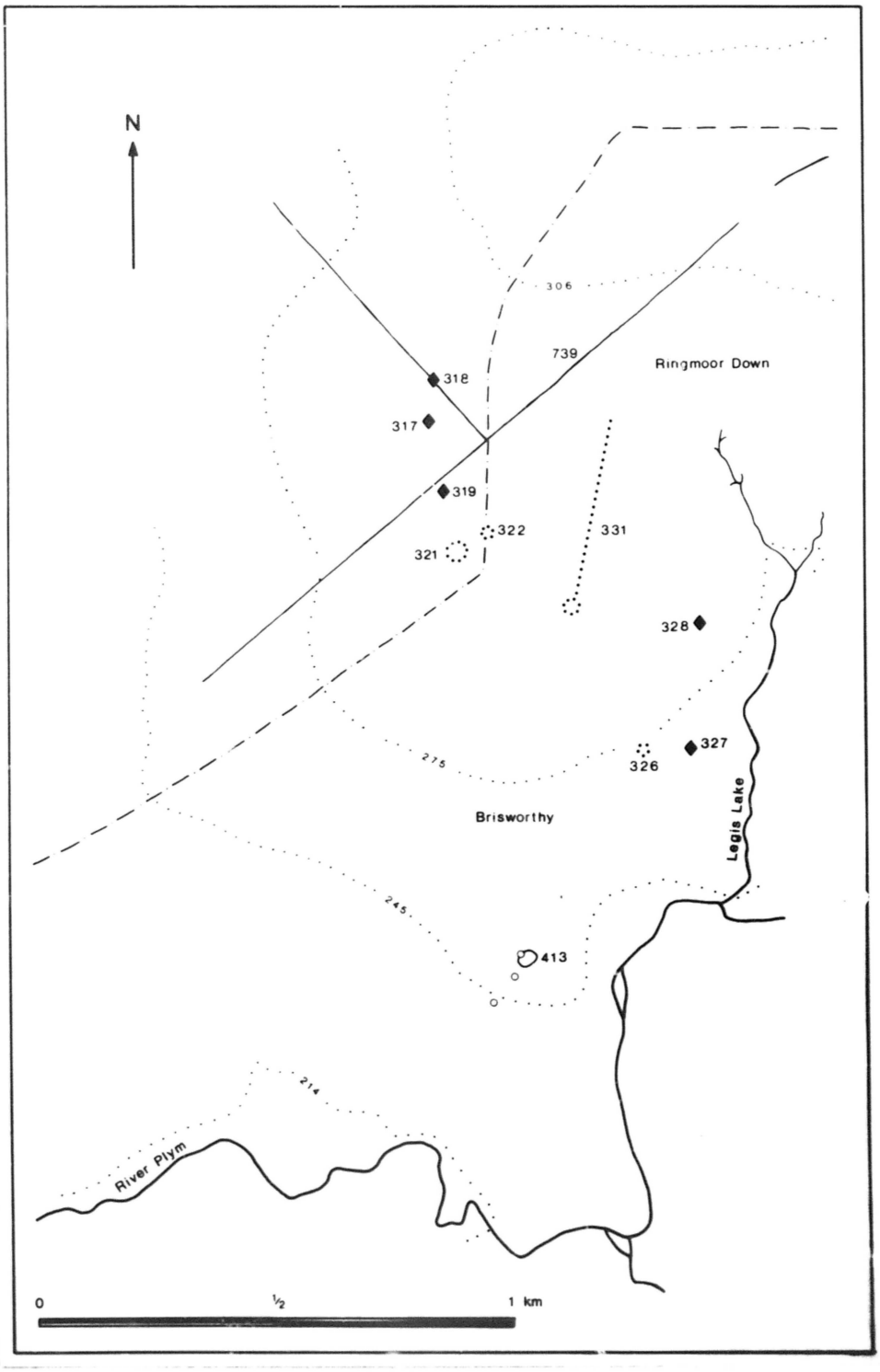


Figure 16
Plym Valley: Legis Tor and Gutter Tor

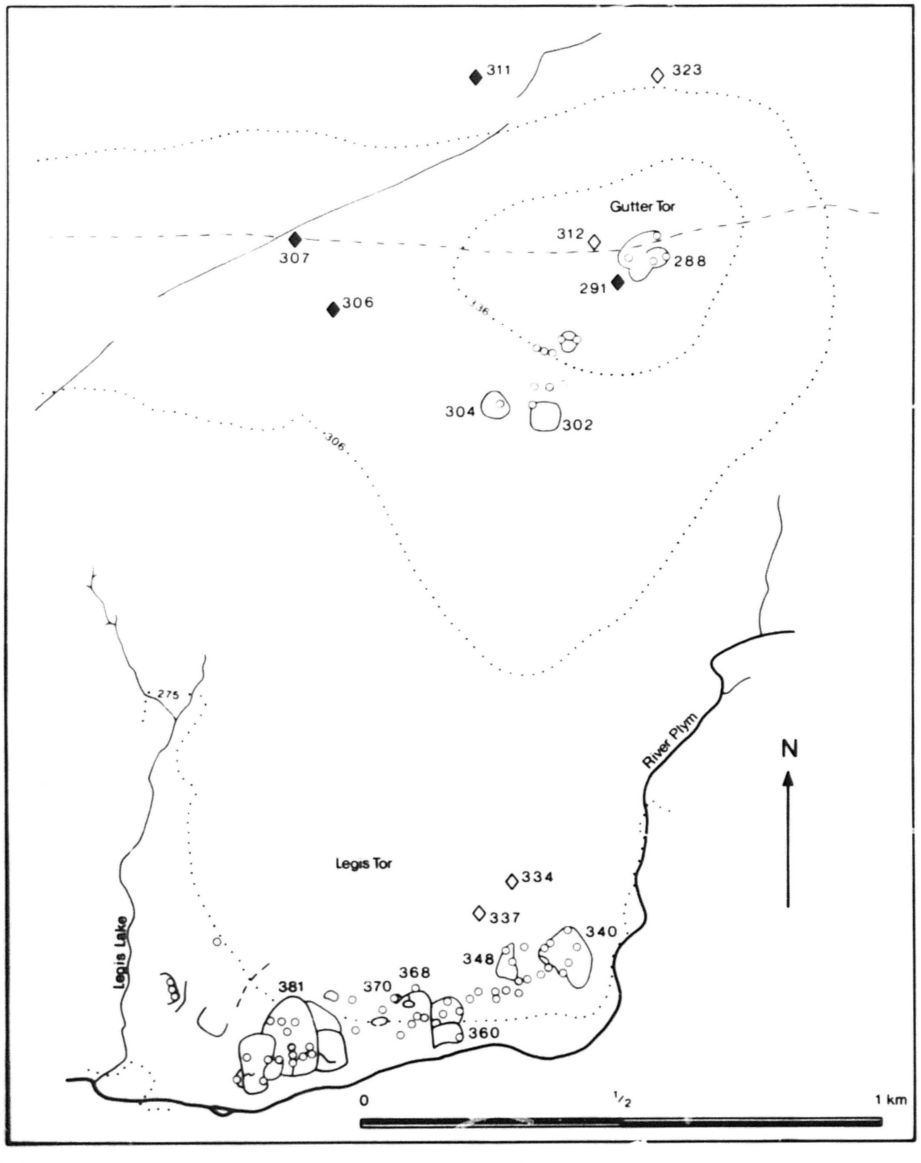


Figure 17
Plym Valley: Eastern Tor and Whittenknowles Rocks

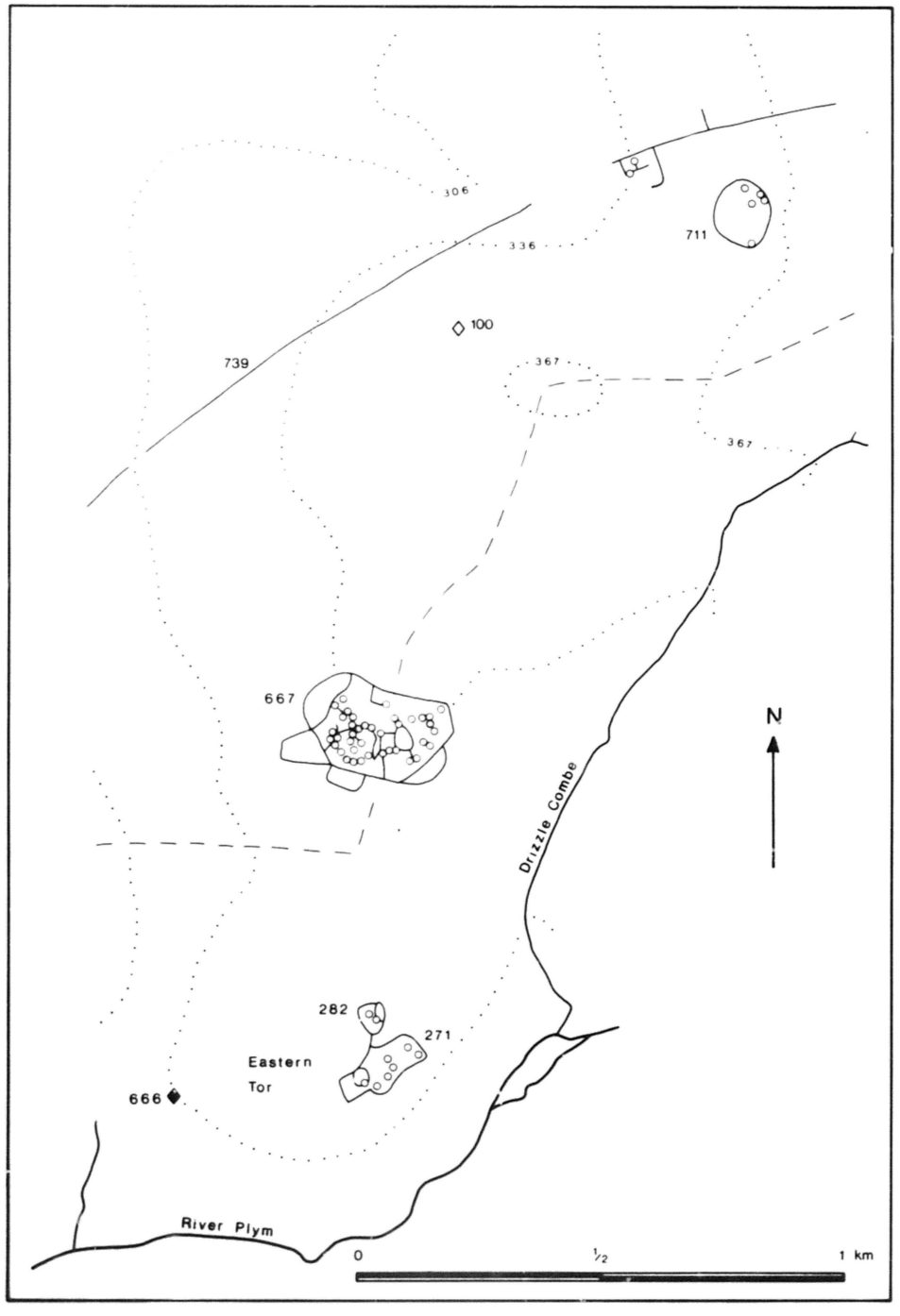


Figure 18
Plym Valley: Drizzlecombe and Eylesbarrow

Figure 19
Plym Valley: Shaugh Moor

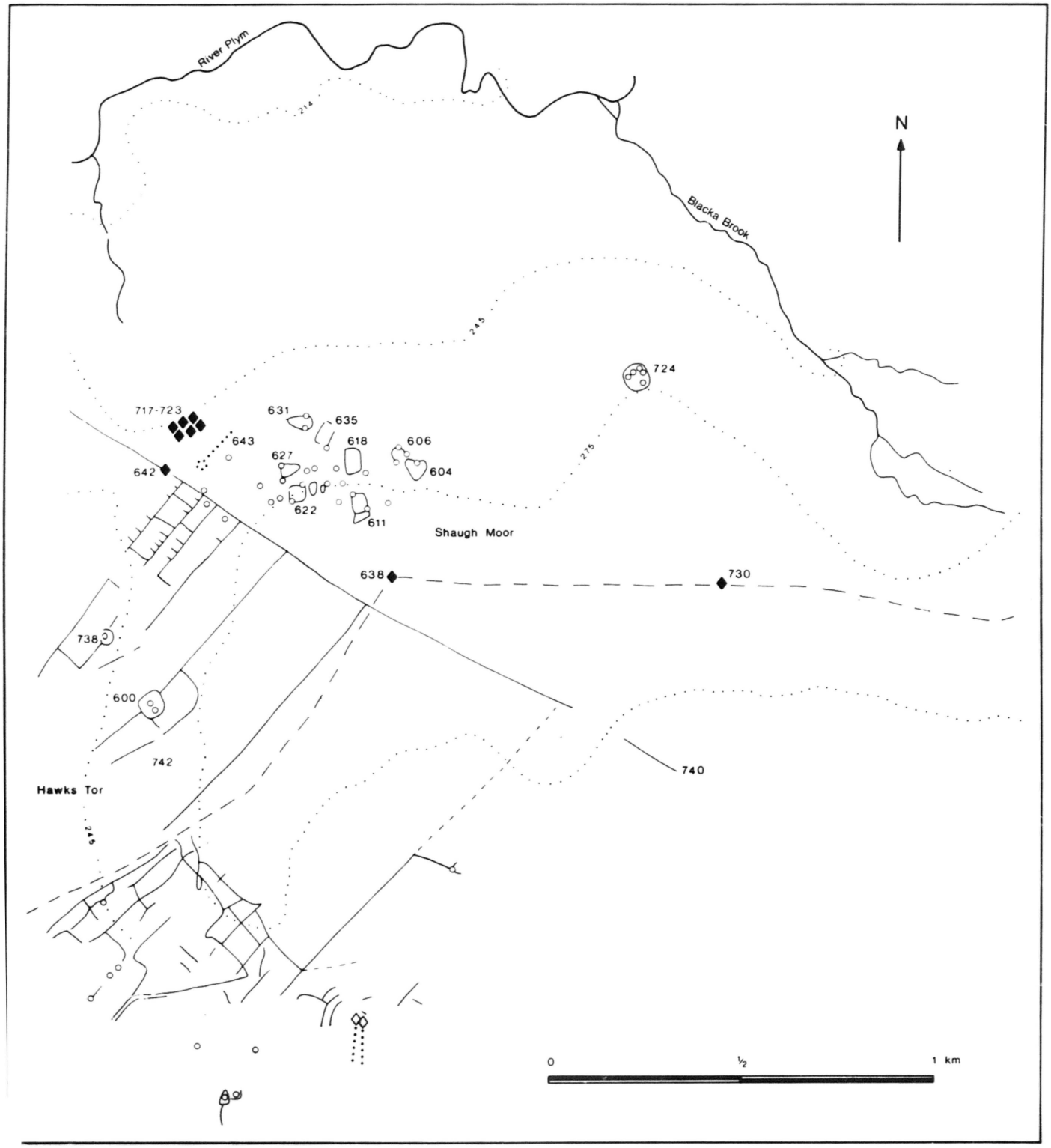


Figure 20
Plym Valley: Trowlesworthy

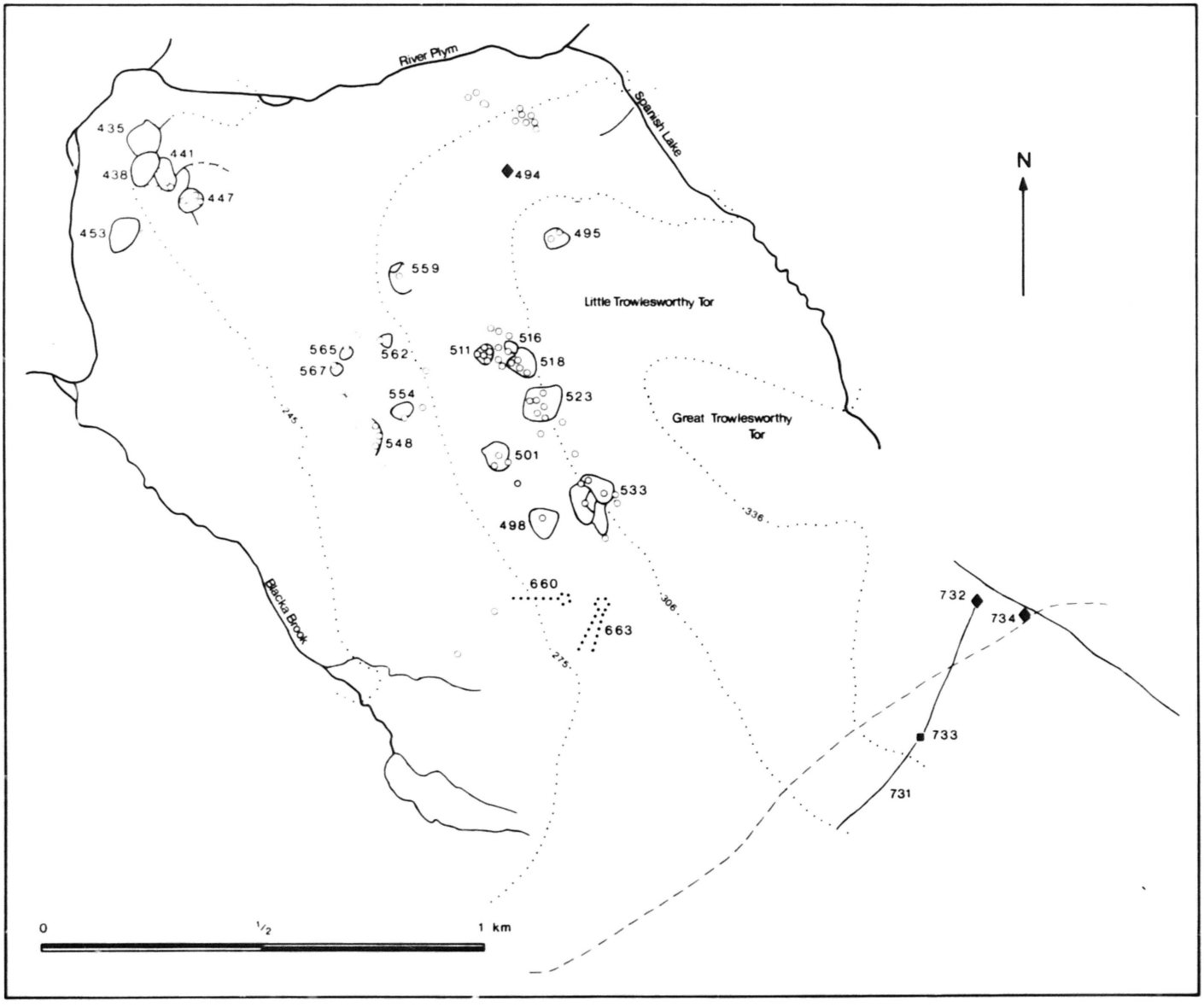


Figure 21
Plym Valley: Willings Walls Warren and Hentor Warren

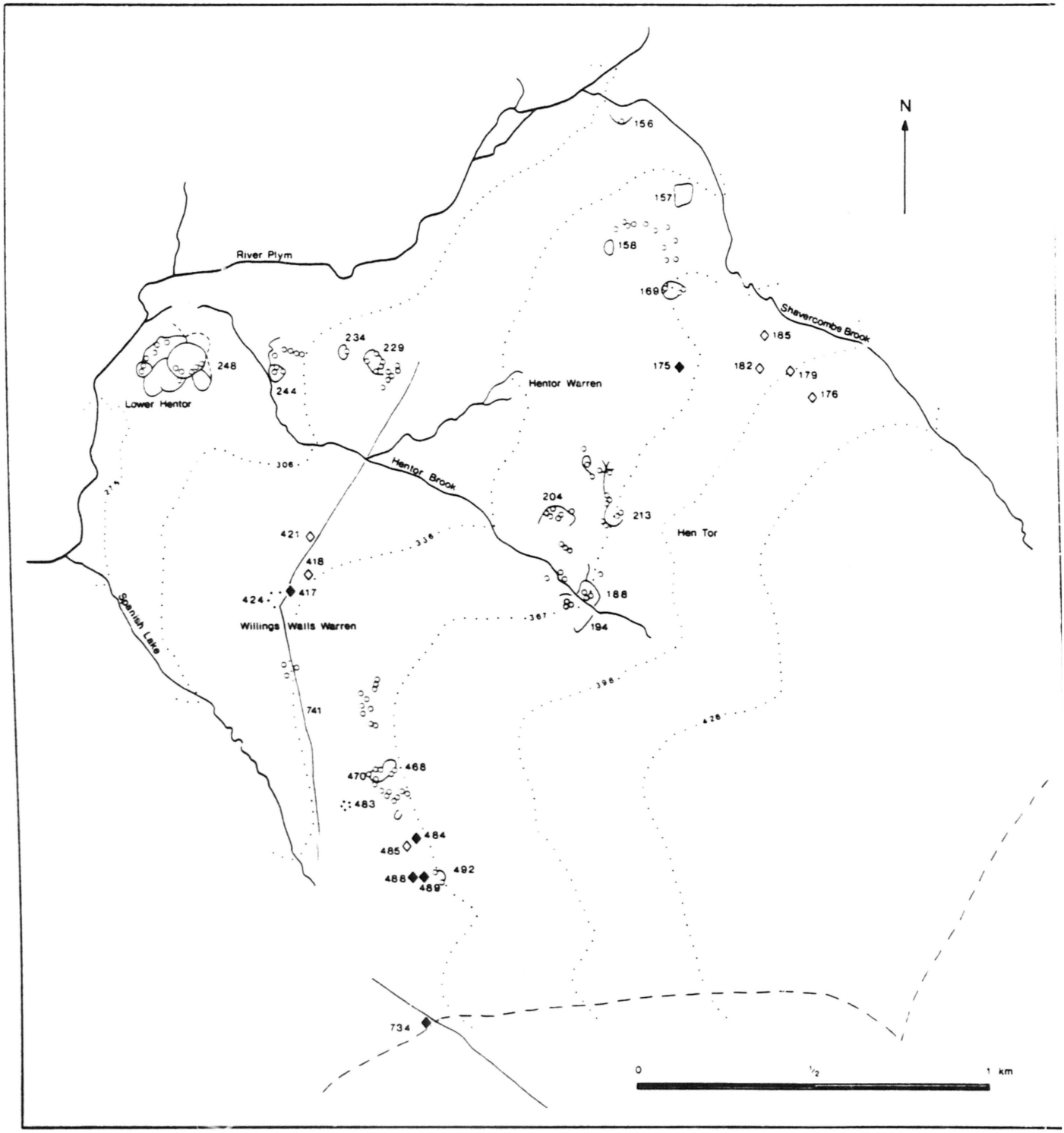


Figure 22
Plym Valley: Giants Hill and Shavercombe Brook to Langcombe Brook

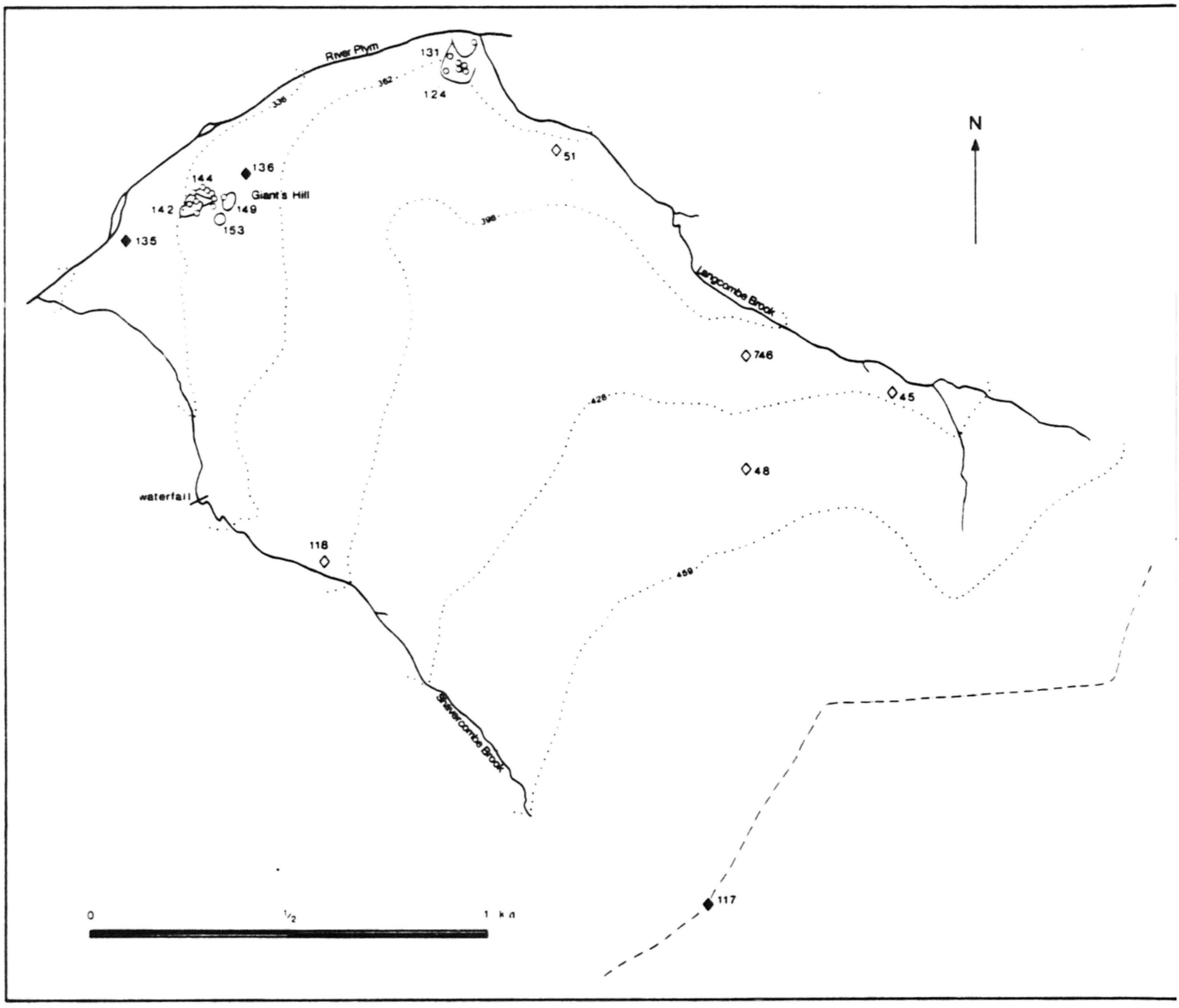
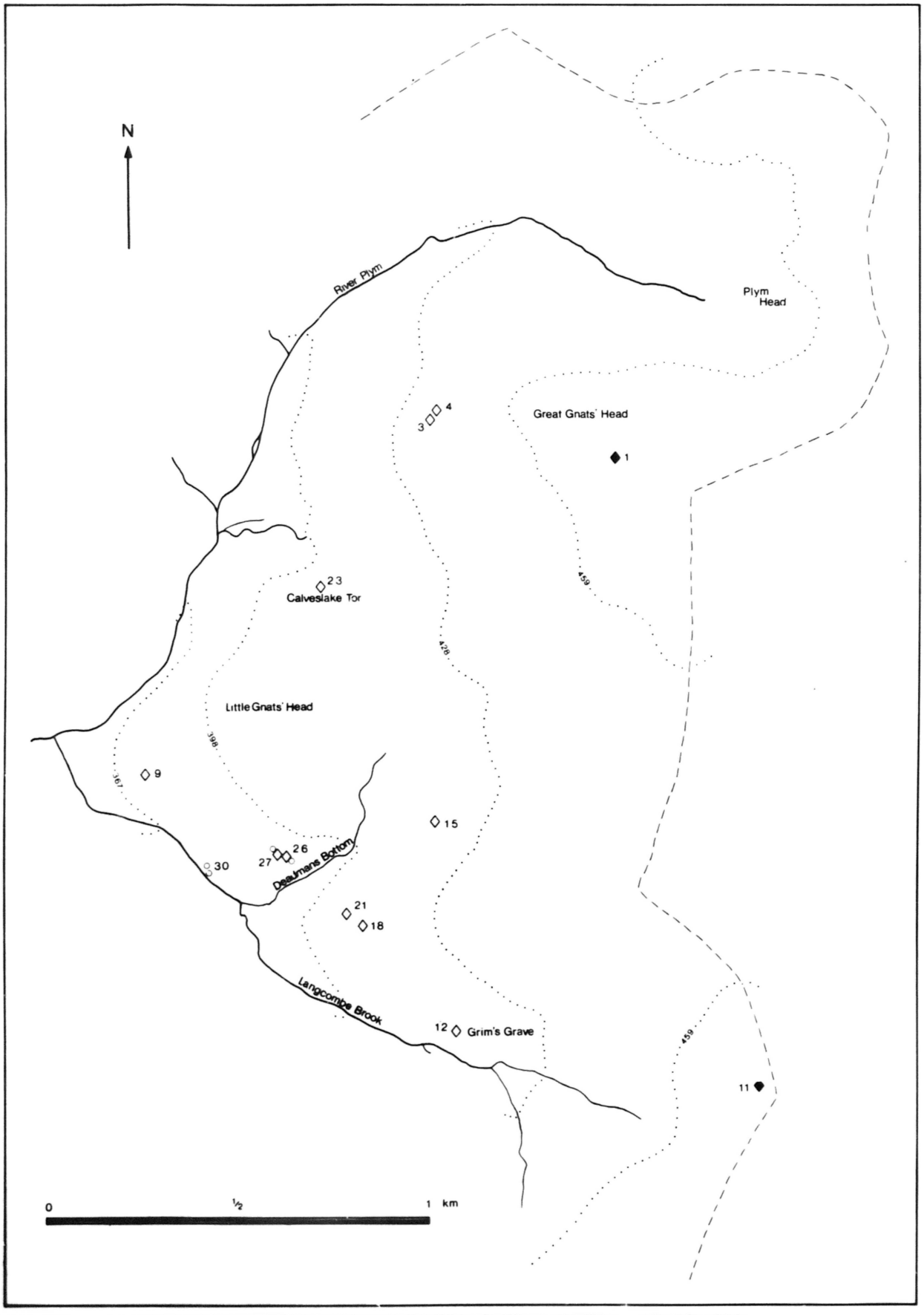


Figure 23
Plym Valley: Langcombe Brook and Calveslake Tor to Plym Head



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