Environmental Report No. 4/79

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Dr. C. Smith,
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Your reference

Our reference

Date 12/1/79

Dear Chris,

Please find enclosed your Interim Soil Report (II) report(s) for the site(s) of Tofignata.

I would be most grateful if you could send me a draft copy of any proposed publication which includes the report(s) or extracts from the report(s).

Please acknowledge receipt of this communication.

Yours sincerely,

Helen.

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INTERIM REPORT (II) ON THE SOILS OF TREFIGNATH, ANGLESEY

By Helen C M Keeley

A second season of excavation at Trefignath Burial Chamber, Anglesey, was carried out by Dr C Smith (IAM, Wales) from 18 March to 29 April, 1978. Further soil studies were carried out on the site by the author during this time. Initial soil investigations carried out in 1977 are described elsewhere (Keeley 1977).

Augering was carried out around the rock outcrop on which the chamber was built and this confirmed that the present-day soils around the site conform to the Rocky Gaerwen series, described by Roberts in 1958. A pit was dug on top of the outcrop SSW of the chamber but the profile was found to be disturbed. A description follows:-

The site of the profile was level, moderately drained and with a vegetation cover of grasses. It was about 5m from the outer curb of the monument. Worked flint/chert was found at 30 cms depth, at the top of the B horizon. 0 to 2 cms was a root mat. 20 to 30 cms was very dark greyish brown (10YR3/2) friable silty clay loam with moderate medium angular blocky structure. Roots were abundant medium to fine fibrous and stones rare, gravel to medium. There were common medium distinct strong brown mottles.

30-40 cms was brown/dark brown (10YR4/3) friable silty loam with weak medium subangular blocky structure. Roots were abundant fine fibrous and stones common, gravel to large. There were occasional distinct medium strong brown mottles associated with stones and root channels.

40 to 42 cms was yellowish brown (10YR5/4) friable silty clay loam with weak medium subangular blocky structure. Roots were common fine fibrous and stones abundant, gravel to large (mainly weathering schist fragments plus some quartz and chert/flint pebbles). Occasional distinct medium strong brown mottles were noted, associated with weathering rock fragments.

Below 42 cms the soil matrix was similar to the horizon above but was dominated by large schist boulders.

Stone slabs against Feature 6

Stone slabs were examined adjacent to Feature 6 (dry stone wall). The slabs appeared to have been placed against the dry stone wall at the same time or soon after the wall was built - there was no soil between the stones which could attribute them to later slip from above. A similar phenomenon has been noted during excavation of a Neolithic chambered tomb at Gwernvale, near Crickhowell, in South Wales and deliberate placement of slabs was concluded in this case also (Britnell 1978, pers. comm.).

A buried soil was located below the revetment wall at this point and this was sampled at 2 cm. intervals for pollen analysis (total 4 samples).

Feature 24

The old ground surface at this point contained black material which could have been organic matter or manganese oxides. A sample was tested by placing a small piece in molten potassium chlorate ($KCLO_3$). The reaction was positive for carbon (deflagration) and manganese (production of a pink residue). Further testing, by placing a sample in 10% sodium hydroxide solution (in distilled water) and shaking, indicated that the carbon was in the form of humic material (ie the organic matter went into solution giving a dark brown colouration to the liquid). The old ground surface thus appears to contain humic material closely combined with some manganese compound(s). Manganese oxides often precipitate out at old land surfaces (Limbrey, 1975) due to changes in soil redox conditions - in this case possibly caused by increased bacterial activity associated with decaying orga nic matter.

Pit 1

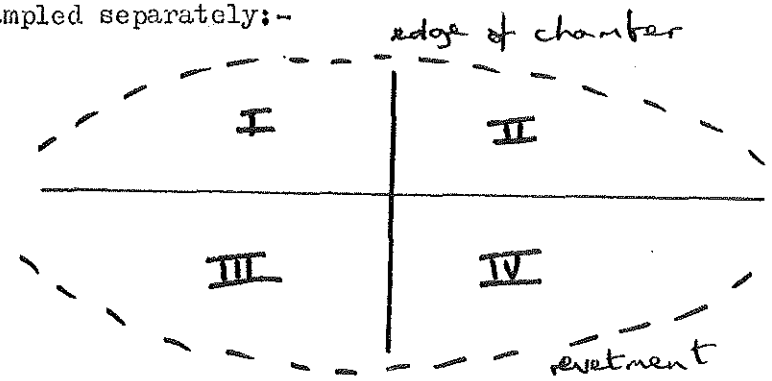
It was confirmed, using the test described above ($KCLO_3$), that the black material which occurred in Pit 1 was some form (or forms) of manganese compound.

Feature 6

A sample was taken from the iron pan. The presence of iron was confirmed (yellow colouration produced on treatment with concentrated hydrochloric acid) and humic material was also found to be present; manganese was absent. Formation (often post-depositional) of iron pans on archaeological sites, due to changes in soil redox conditions, is often noted (Limbrey 1975).

The Buried Soil

It was possible to examine quite extensive areas of buried soil at two points on the site. Horizontal excavation was carried out in one area (A) to see if this would prodcue a more representative assessment of the buried soil. The area ,which was north of the eastern chamber, was divided into quadrants, which were sampled separately:-

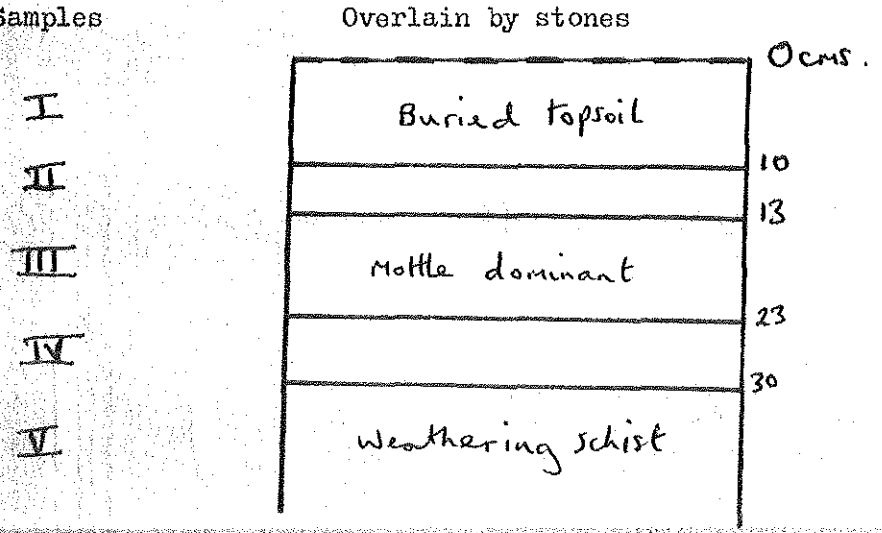


Occasional charcoal fragments occurred throughout.

This method was found to be unsatisfactory as it was difficult to pick up the transition from one horizon to another with depth. It was therefore decided to concentrate on examining and sampling vertical sections. Twosections were examined in Area A, (1) nearest to the chamber and (2) against the revetment, and these are described below:-

Section (1) (Area A)

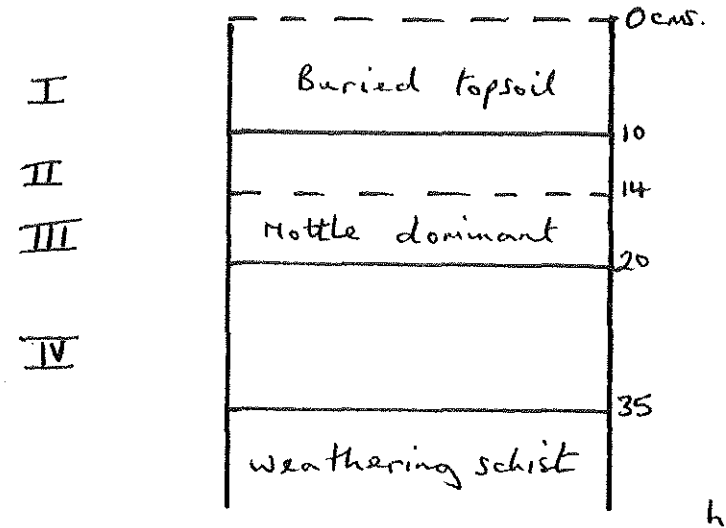
Samples



humose
0 to 10 cms was dark brown (10YR3/3) friable sandy silt loam with weak to moderate fine subangular blocky structure containing many gravel to small stones, including occasional quartz fragments (up to 5 mm. diameter) and very small iron/manganese concretions. Roots were abundant, fine fibrous.
10 to 13 cms was dark yellowish brown (10YR4/4) moderately friable sandy silt loam with weak to moderate fine subangular blocky structure, containing few yellowish brown (10YR5/6) fine distinct mottles. Stones were many, gravel to medium. including occasional quartz fragments (5 mm diameter). Roots were common, fine fibrous.
13 to 23 was dark yellowish brown (10YR4/4) moderately friable sandy silt loam containing abundant fine, distinct strong brown (7.5 YR5/6) mottles. Patches of very dark greyish brown (10YR3/2) organic material were also present, associated with root channels. Structure was weak medium granular, stones were common gravel to small and roots common, fine fibrous.
23 to 30 cms was dark yellowish brown (10YR4/4) moderately friable sandy silt loam with common distinct fine strong brown (7.5YR4/6) mottles. There were also a few coatings of light brownish grey (2.5Y6/2) material. Structure was moderate medium subangular blocky, stones were common, gravel to small, and roots few, fine fibrous.
Below 30 cms was light brownish grey (2.5Y6/2) friable sandy loam with moderate medium subangular blocky structure containing common dark yellowish brown (10YR4/6) prominent medium mottles. Stones were abundant, gravel to small, consisting of weathering schist fragments. Roots were few, very fine fibrous. Small iron/manganese concretions, up to 5 mm diameter, were noted.

Section (2) Area A

This section was fairly similar to (1) but did not have the thin yellowish brown layer (10-13 cms) seen in (1).



0 to 10 cms was dark brown (10YR3/3) friable humose sandy silt loam with moderate fine subangular blocky structure containing common gravel to small stones, including occasional quartz fragments, and abundant fine fibrous roots.

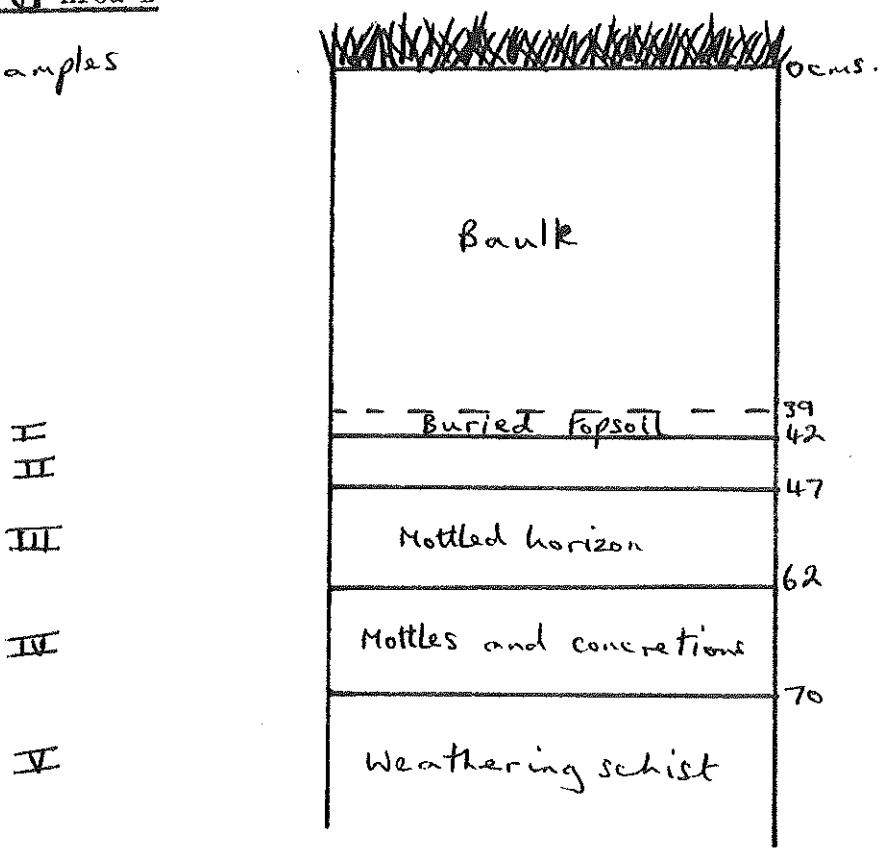
10 to 20 cms was dark yellowish brown (10YR4/4) moderately friable sandy silt loam with moderate medium subangular blocky structure. Common distinct fine strong brown (7.5YR4/6) mottles were noted. Stones were common, gravel to medium, including occasional small quartz fragments, and roots were common, fine fibrous. Patches of very dark greyish brown (10YR3/2) organic material were noted, associated with root channels, as in section (1).

20 to 35 cms was dark yellowish brown (10YR4/4) moderately friable sandy silt loam with moderate fine subangular blocky structure. Common fine to medium distinct strong brown (7.5YR4/6) mottles were noted. Fine, distinct, coatings of light brownish grey (2.5Y6/2) material were present. Stones were common, gravel to small, including occasional quartz fragments (up to 5 mm in diameter) and roots were common, fine fibrous. Occasional Fe/Mn concretions (up to 5 mm in diameter) were noted.

Area B

Two sections were examined and sampled, (1) beneath a baulk and (2) beneath the revetment wall.

Section (1) Area B



The boundary between the base of the baulk and the buried soil was indistinct but occurred at about 39 cms below the top of the baulk.

39 to 42 cms was very dark brown (10YR2/2) friable humose sandy silt loam with moderate fine subangular blocky structure containing common gravel to small stones, including occasional small quartz fragments, and abundant fine fibrous roots. A few small organic pellets were noted.

42 to 47 cms was dark brown (10YR3/3) moderately friable sandy silt loam with moderate medium subangular blocky structure. Patches of very dark brown (10YR2/2) material, similar to that of the layer above, were noted. Stones were common gravel to small, including occasional small quartz fragments, and roots common, fine fibrous. Few Fe/Mn concretions with organic matter, 1 to 2 cms diameter, occured.

47 to 62 cms was dark yellowish brown (10YR4/4) moderately friable sandy loam with moderate medium subangular blocky structure. Common fine, distinct, strong brown (7.5YR4/6) mottles occurred. Stones were common gravel to small,

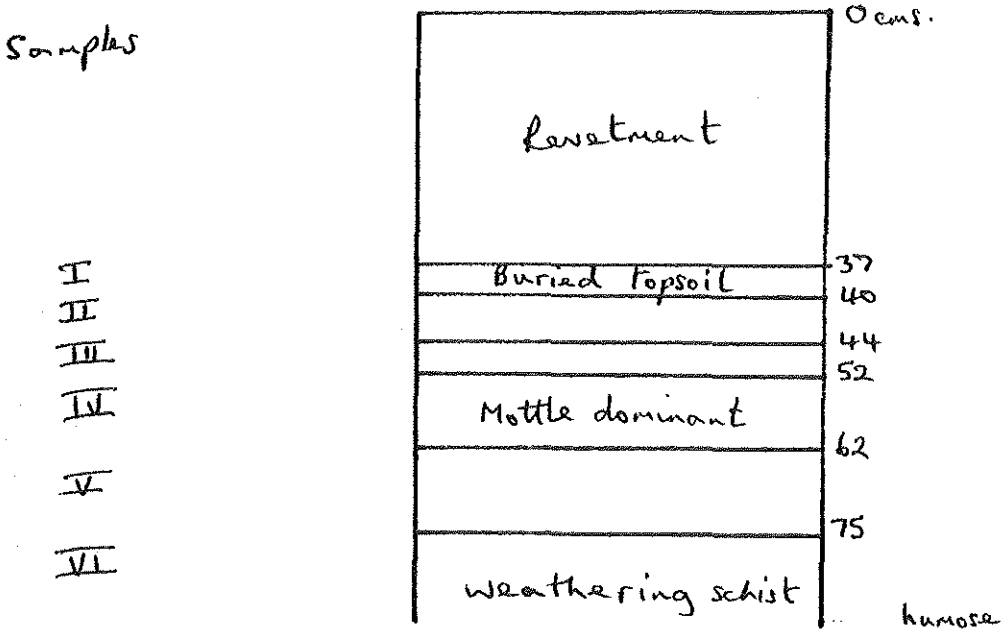
and roots few, fine fibrous. Concretions of Fe/Mn/organic matter (up to 1 cm diameter) were fairly common.

62 to 70 cms was dark greyish brown (2.5Y4/2) moderately friable sandy loam with weak medium subangular blocky structure containing common, prominent, medium, strong brown (7.5YR4/6) mottles. Stones were many, gravel to small, including occasional small quartz fragments, and roots were very few, very fine fibrous.

Concretions were an important feature of this horizon ie. many Fe/Mn/organic matter up to 2 cms diameter.

Below 70 cms was dark greyish brown (2.5Y4/2) moderately friable sandy loam with strong medium subangular/angular blocky structure, containing common medium/fine prominent dark reddish brown (5YR3/4) mottles. Stones were many, gravel to medium, consisting of weathering schist fragments and roots were few, fine, fibrous. A few Fe/Mn concretions (up to 1 cm diameter) were noted.

Section (2) Area B



30 to 40 cms was very dark brown (10YR2/2) moderately friable, humose sandy silt loam with moderate fine subangular blocky structure, containing common gravel to small stones, including quartz fragments (up to 1 cm diameter). Few prominent fine greyish brown (2.5Y5/2) mottles were noted and roots were abundant, fine fibrous.

40 to 44 cms was dark brown (10YR3/3) friable sandy silt loam with moderate fine subangular blocky structure, containing common gravel to medium stones and common fine fibrous roots. Concretions of Fe/Mn/organic matter up to 2 cms in diameter were common.

44 to 52 cms was dark yellowish brown (10YR4/4) moderately friable sandy silt loam with moderate to strong, medium subangular blocky structure, containing common gravel to small stones, including occasional quartz fragments (up to 5 mm diameter) and common very fine fibrous roots. Many Fe/Mn/organic matter concretions (up to 1 cm diameter) were noted.

52 to 62 cms was brown/ dark brown (10YR4/3) friable sandy loam with moderate fine subangular blocky structure, containing common distinct medium strong brown (7.5YR4/6) mottles. Stones were common gravel to small, and roots few, very fine fibrous. Common Fe/Mn concretions (up to 1 cm diameter) occurred.

62 to 75 cms was dark greyish brown (2.5Y4/2) moderately friable sandy loam with moderate to strong medium subangular blocky structure, containing many gravel to small stones, including occasional quartz fragments, and few very fine fibrous roots. Concretions of Mn/Fe/organic matter up to 2 cms diameter were common.

Below 75 cms was dark greyish brown (2.5Y4/2) moderately friable sandy loam with moderate medium subangular blocky structure, containing common distinct fine dark yellowish brown (10YR4/4) mottles. Stones were abundant, gravel to medium, mainly weathering schist but including numerous small quartz fragments. Roots were few, very fine fibrous.

Comment

There did not appear to be any major differences between the buried soil profiles examined. The soil in area B was slightly less silty than in area A in the lower part of the profile, probably reflecting slight variations in the parent material. Mottling and the occurrence of Fe/Mn concretions were common - more so than in the soil outside the mound area - and probably reflected changes in soil redox conditions related to the presence of the structure, as mentioned earlier.

There were indications of downward movement of organic matter in the profiles and also of some degree of podzolisation (further analytical work is required to confirm the latter). The presence of occasional charcoal fragments suggests that the soil was disturbed prior to building the burial chamber.

Further work

It would be useful to examine further buried soil sections to confirm the nature of the pre-mound profile. Analytical work should be carried out on samples collected in 1978 and during the forthcoming excavations to see if the soil is podzolised. It would be useful to carry out micromorphological investigation of a buried soil profile to add to information gained to date - if someone can be found to undertake this work.

References

Britnell, W J (1978) Personal Communication

Keeley, H C M (1977). Interim Report on The Soils of Trefignath, Anglesey. Ancient Monuments Laboratory Report No 2300.

Limbrey S (1975). Soil Science and Archaeology. Pub. Academic Press, London

Roberts E (1958). The County of Anglesey: Soils and Agriculture. Memoirs of the Soil Survey of England and Wales. HMSO.