

Ancient Monuments Laboratory
Report 105/89

SOIL REPORT: TULLIE HOUSE,
CARLISLE, CUMBRIA.

Maureen McHugh

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Summary

A sequence of two buried soils overlying the ramparts of a 2nd century fort, and subsequently sealed by Medieval buildings, were examined. It was concluded from the depth and degree of profile development that exposure of the lower soil had been short-lived. Textural differences suggested that the topsoil may not have developed in situ. The upper profile was developed in depositional material and probably represents a phase of stability, though a timescale could not be given.

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TULLY HOUSE, CARLISLE (30.6.89)

SOILS REPORT

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1) Soil development overlying the rampart of the 2nd C Roman Fort, subsequently sealed by Medieval structures (CAR 89 ANN D 6 SD10).

The profile description is detailed in section 2.

Three main points emerge from a qualitative examination of the soil sequence: i) the high degree of profile development within contexts 27 and 187, ii) the truncated nature of the lower profile comprising only a humose A (context 217) and relatively unaltered clay B/Cg subsoil horizon (context 190), and iii) the textural discontinuity between contexts 27/187/217 and 190.

i) The upper profile comprises a humose A horizon (context 27), B and Bg horizons (both context 187). The profile has well developed horizons which lack sharp boundaries. Root channels, though presently void, are vertically oriented and continuous throughout. Morphological features indicate a degree of organic matter mobility and increasing wetness with depth, the latter mediated by the slow permeability of the underlying clayey material (context 190). It can be concluded that the upper profile represents a period of stability during which plant growth and normal soil processes were active. Intuitively this phase must have been relatively prolonged, though a time scale cannot be given.

ii) The truncated nature of the lower profile (contexts 217, 190) and the sharpness of the boundary between the humose A and relatively unaltered clayey B/Cg suggests that soil development and therefore exposure were short-lived. The complete absence of a transitional B horizon between the A and B/Cg suggests a depositional, rather than pedogenetic origin for the humose A. Roots within the B/Cg are largely continuous with the upper profile and, like associated morphological indicators of soil processes (ferruginous mottles and organic matter accumulations), appear to be related to the later phase of stability. Weakly developed structures within the upper B/Cg however, suggest that it was subject to wetting and drying for at least a short period, though this was probably limited.

iii) The textural discontinuity between the upper profile, the lower A (all sandy silt loams) and the clayey rampart material (B/Cg), suggests that the A2 and overlying horizons did not develop in situ and thus implies a depositional origin for all horizons overlying 190, although the lower A must represent an earlier phase of deposition.

iv) Concluding remarks

A field assessment of the soil sequence overlying the rampart suggests i) the topsoil of the lower truncated profile may not have developed in situ, ii) soil development within the lower soil and

thus exposure was shortlived, iii) the upper profile may be developed in depositional material, and iii) the upper profile represents a prolonged period of stability, plant growth and soil development.

2) CAR 89 ANN D 6 SD10

(Descriptions after Hodgson, 1976)

A(1) 0-14 cm (context 27)

Very dark greyish brown to brown, humose sandy silt loam (10 YR 3/2, 10 YR 5/3); very dark brown to black humose inclusions (10 YR 2/2 to 10 YR 2/1); abundant fine and distinct yellowish brown mottles (10 YR 5/8); rare strong brown ferruginous accumulations associated with root channels (5 YR 5/8); very slightly porous; root channels are void, some coated with organic matter; weak, slightly sticky, non plastic; very weak fine angular blocky structure; common fine rounded weathering stones towards base; low packing density; boundary clear and wavy.

B(g) 14-22 cm (context 187)

Very dark greyish brown (50%) to dark yellowish brown (30% weathering sandstone fragments) coarse sandy silt loam (10 YR 3/2, 10 YR 4/4); few fine, subangular unweathered sandstones; black humose segregations and stainings associated with root channels and the soil matrix (10 YR 2/1); abundant brownish yellow flecks (10 YR 6/6); common fine coal fragments; very weak, fine angular blocky structure to massive; slightly porous, 2-3 % fine to very fine macro-pores continuous with A(1); pores void but associated with humose accumulations; moderately firm, very slightly sticky, slightly plastic, slightly fluid; low to medium packing density; becoming paler with depth; boundary wavy and clear.

Bg 22-30 cm (context 187)

Brown/dark brown to dark yellowish brown, sandy silt to clay loam (10 YR 4/3, 10 YR 4/4); black to very dark brown accumulations associated with void root channels continuous with B(g) (10 YR 2/1, 10 YR 3/2); common fine to medium, subrounded, weathered sandstones; common, discrete, strong brown ferruginous accumulations (7.5 YR 4/6) associated with root channels; low to medium packing density; common fine, discrete yellowish brown inclusions (10 YR 5/8); charcoal inclusions (<0.5 cm); very weak medium angular blocky structure to massive; slightly porous; moderately firm, slightly sticky, slightly fluid; boundary clear and smooth.

Upper A(2) 30-33 cm (context 217).

Transitional horizon; very dark greyish brown to brown sandy silt loam (10 YR 3/2, 10 YR 5/3); common brownish yellow weathering sandstone fragments (10 YR 6/6); few fine charcoal inclusions; rare, distinct organic accumulations associated with root channels continuous with Bg; common fine to medium unweathered sandstones; very slightly porous; weak, slightly fluid, slightly plastic; very weak angular blocky structure to massive; low to medium packing density; boundary clear and smooth.

A(2) 33-38 cm (context 217)

Dark brown to very dark greyish brown humose sandy silt/clay loam (10 YR 3/2, 10 YR 3/3); fine inclusions of yellowish brown

weathering sandstones (10 YR 5/4); few fine charcoal inclusions; very slightly porous; root channels void and associated with black organic matter accumulations (10 YR 2/1); very weak fine angular blocky structure to massive; moderately firm, slightly sticky, moderately fluid; boundary sharp and wavy.

B/Cg > 38 cm (context 190)

Brown to dark yellowish brown clay (10 YR 4/4, 7.5 YR 5/2); few faint strong brown ferruginous mottles (7.5 YR 4/6) associated with paler areas of iron depletion (7.5 YR 6/2); fine root channels, continuous with upper profile, coated with very dark greyish brown organic matter (10 YR 3/2) and distinct organic/sesquioxide coatings (7.5 YR 2/0); rare fine root channels infilled with yellowish red ferruginous deposits (5 YR 5/8) very firm, deformable and plastic; very weak fine prismatic structure, structural faces stained with dark reddish brown ferruginous deposits (5 YR 2.5/2); very slightly porous; high packing density.

Hodgson, J.M., 1976. Soil Survey Field Handbook. Technical Monograph No. 5. Harpenden.