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Rothamsted Report for 1951

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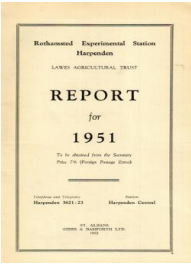
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Soil Survey of England and Wales

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SOIL SURVEY OF ENGLAND AND WALES

By D. A. Osmond

In spite of many requests for soil maps of areas other than those where routine surveying is being continued, satisfactory progress has been made in the systematic surveys in Lancashire and Cambridgeshire and work has been started in Hertfordshire and Buckinghamshire on sheet 238 (Aylesbury).

Publication of the map and memoir of sheet 138 (Wem) should not be long delayed and the map and memoir of sheet 296 (Glastonbury) is in an advanced state of preparation. The soil map of Anglesey is being prepared for printing as sheet 106 (New Popular Edition). Revision of older work in North Wales is in progress with a view to its publication as a memoir.

Lancashire

Sheet 75 (*Preston*)

Detailed surveying was continued and about 30,000 acres mapped in three separate regions. The first is the lowlying land in the south-west of the sheet and consists of the alluvial flats of the Douglas and the moss lands to the west. Here the till covering most of the Lancashire plain is largely overlain by more recent deposits viz.: the Shirdley Hill Sand, which is probably a wind-blown material deposited against slight rises, and peat and alluvium.

Peat still covers by far the largest part of this area. It is mainly a basin peat—a black, pseudo-structural material with about 90 per cent of organic matter. The alluvial soils are extremely variable and several types have been recognized. The Shirdley Hill Sand appears to have been covered with peat and raw humus in the past and humus podzols are common on this parent material. The commonest series found are the Crannymoor and Sollam, though several others have been recognized and described.

The second area comprises Anglezarke, Heapey, Wheelton and Withnell Moors. Structurally it is a dissected plateau rising sharply from the plain and is formed of nearly horizontally bedded sandstones and shales, patchily covered with till. Those parts which were formerly enclosed have been mapped on a series basis but it proved necessary to group the soils on the open moorland into complexes. The dominant series in the enclosed fields are the Hallsworth, Brickfield and Anderton. The soils in the open moorland have been divided into peat over 3 ft. in depth, peat between 1 and 3 ft. thick and two complexes. One of these is dominated by soils developed from till that are shallow, very stony and patchily covered with less than 1 ft. of peat; the Brickfield and Belmont series are the most commonly occurring soils of this nature. The other complex is dominated by rocky and very shallow phases of soils of the Anglezarke, Rivington and Blindhurst series.

The third region surveyed is a continuation, as far north as Mellor, of the previously described area north-east of Chorley.

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The soil picture is very similar though the large morainic deposits west of Blackburn give rise to fairly large areas of the Newport and Wem series, the latter in many places, showing a tendency to pass into humus podzols.

Cambridgeshire

Sheet 188 (*Cambridge*)

A further 30,000 acres have been surveyed by the team working on this sheet and approximately one-half of the map is complete. Two areas were surveyed, one lying north of Newmarket, around Chippenham, Freckenham and West Roe, the other being nearer Cambridge in the vicinity of the Wilbrahams, Bottisham and Lode. In both areas gently undulating downland with its higher levels covered with drift gives way to the level fens lying to the north-west. The more northerly district is drained by the Kennet and Snail while the southern area is drained by Swaffham Bulbeck Lode and the Little Wilbraham River leading through Quay Water into Botisham Lode.

Drift deposits in the northern district provide soils of both the brown earth and calcareous soil groups. The profiles are similar and consist of warm brown sandy clay loam, loam, or sandy loam, overlying brighter yellow-brown material of similar textures. The soils of lighter texture are sometimes slightly acid but in general the soils are calcareous and would be grouped with the calcareous soils. Lenticles of clay occasionally appear in the profile and the soils are often stony. In the southern area, the texture is often heavier, the colours are duller and calcium carbonate is almost invariably present.

Where free from drift, the Chalk Marl and Grey Chalk give rise to rendzinas of a clay loam texture, the surface soil being grey-brown in colour, the subsoil dull yellowish brown. In depressions, poorly drained soils with yellow-brown mottling in the subsoil are found. A series of soils consisting of a variable mixture of chalk with drift, frequently on sloping land, also occurs.

Gley soils have been recorded on the Gault clay and are succeeded by the fen which has a complicated soil pattern. Alluvial soils are developed on deposits from the Chalk Marl and sandy Chalk Marl, and other river deposits of variable texture, while peat or peaty loam, varying in thickness from 1 to 36 in. may be found overlying these as well as the Gault clay. Quarrying for phosphate nodules has resulted in many soils being disturbed.

Yorkshire

Sheets 70 (*Leeds*) *and* 71 (*Selby*)

Virtually no work has been done on these two sheets because of a request for an examination of a large number of restored opencast coal workings in the Midlands. The work will form part of a report to be issued shortly by the Statistics Department. It has been shown that profile studies can be of great value in elucidating problems likely to arise after restoration.

Hertfordshire and Buckinghamshire

Sheet 238 (*Aylesbury*)

The Hertfordshire portion of the sheet was covered during a reconnaissance survey in 1945 when 8,500 acres around Tring were

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mapped in detail as a " sample " area. During the past year some 4,000 acres of woods and commons on the Chiltern Hills have been surveyed. The soils are derived from the Chalk and from Clay-with-Flints and associated drifts. Five principal series, namely, Icknield, Wallop, Winchester, Batcombe and Coombe have been distinguished, all of which but the last have been previously described.

Soils under beech-woods, which are essentially natural, have been investigated in detail and fall into four fairly well-defined major groups, viz. : rendzinas, brown earths of high and low base status, and slightly podzolized soils. Rendzinas, with a neutral to alkaline reaction, are found on the steepest slopes and have a dark greyish brown, very friable, mull-like A_1 horizon 4 to 7 in. thick grading through a brashy transitional layer, to hard chalk at 9 to 15 in.

Slightly acid to neutral brown earths of high base status with a very dark greyish brown, granular A_1 horizon of coarse mull and a brown B horizon of similar texture occur on thin Clay-with-Flints or flinty Head overlying Chalk or chalky down-wash at 9 to 15 in. Acid brown earths of low base status (pH 4·0 – 5·5) developed on thick plateau and valley drifts are by far the most extensive soils ; the profiles are characterized by the differentiation of brown or yellowish brown, relatively light textured, structureless and friable A horizons up to 15 in. thick, which become much greyer on drying. The A_1 is a fine mull rarely more than 4 in. thick. The B horizons are redder, firmer, cloddy and retain their colours when dry. In the slightly podzolized soils occurring locally on the plateau drift, the A_1 horizon of the brown earths is replaced by a very acid, black mor (pH 3·7 – 4·0) beneath which develops a narrow, discontinuous bleached A_2 horizon and a rusty-stained incipient B horizon. The onset of mor-formation appears to be favoured by a dense canopy which excludes other vegetation, but other factors including the base status of the parent material, natural drainage conditions, and the micro-climate, are among the prime causes.

Each stage in the succession from rendzinas to slightly podzolized soil is associated with change in the ground flora. Microbiological and faunal activity seem to reach a maximum in the high base status brown earths, but beech trees grow more vigorously on the rather more acid soils, probably because they are generally deeper.

Other Work

Collaboration has continued with the Veterinary Laboratory at Weybridge in investigating Johnnes disease, some farms having been surveyed and herbage samples collected for analysis. A number of farms have been surveyed for County Authorities, the National Agricultural Advisory Service and the National Institute of Botany and many maps have been prepared for the Agricultural Land Service (Wales). The survey of the Monmouth Moor undertaken for the Welsh Agricultural Land Sub-Commission was extended a short distance into the uplands. The first part of a catalogue of established soil series has been issued.

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