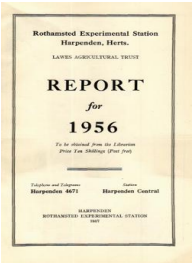
ROTHAMSTED RESEARCH

Report for 1956

Full Table of Content



Soil Survey of England and Wales

D. A. Osmond

D. A. Osmond (1957) *Soil Survey of England and Wales ;* Report For 1956, pp 215 - 221 **- DOI: https://doi.org/10.23637/ERADOC-1-117**

SOIL SURVEY OF ENGLAND AND WALES

D. A. OSMOND

The area mapped shows a slight decrease compared with that in 1954–55 because maps and memoirs were being prepared for publication, but, even so, about 250 sq. miles have been surveyed. Two further sheets have been completed, new work on Sheet 19 (Hexham) undertaken and survey has been continued in the areas previously recorded. With the completion of Sheets 94 (Llandudno) and 106 (Bangor), the centre at Bangor has been closed and the surveyor transferred to Cardiff.

Two members of the staff have resigned: J. F. Harrop joined the Soil Survey of Uganda and L. F. Curtis accepted an appointment in the Geography Department at Bristol University. Both will be missed, for they were competent surveyors and very much liked by their colleagues. The vacancies have been filled, and two additional surveyors, E. M. Bridges and C. P. Burnham, have been appointed. Miss A. M. Du Feu was appointed to assist with clay mineral studies. In addition, R. R. Storrier and J. Loveday, both from Australia, are working with the Soil Survey, the former has mapped soils developed on the Ironstone near Banbury, and the latter will be working on the soils of the district around Henley-on-Thames. J. Stark has been appointed to the Colonial Pool of Soil Surveyors and is working in British Guiana, A. O. Ballantyne and G. F. M. Murdoch are still working in Northern Rhodesia and Swaziland respectively. C. A. H. Hodge has returned from Somaliland to his duties in Cambridge. R. S. Seale and A. J. Thomasson have been given leave to continue survey work on an irrigation project in Iraq. D. A. Osmond spent a short time in Malta with D. M. Lang, who is making a survey of the island.

A. Muir attended the 6th International Congress of Soil Science at Paris and acted as Chairman of Commission V (Genesis and Cartography). B. W. Avery (who presented a paper), D. C. Findlay and A. Crompton also attended and, with A. Muir, participated in the Post-Congress tours of Eastern and South-eastern France.

Members of the Soil Survey organized a highly successful excursion to the Chilterns and Vale of Aylesbury for the British Society of Soil Science.

NORTHUMBERLAND

Sheet 19 (Hexham)

The work may be broadly divided into two phases, preliminary examination of soils and parent materials on Sheet 77 (Hexham, New Popular Edn.) and, later, detailed surveying at 6 inches to 1 mile scale on Sheet 19 (Hexham, 3rd edn.).

The early examination showed that glacial drift of widely differing origins is common, and only occasionally are the underlying

https://doi.org/10.23637/ERADOC-1-117

rocks exposed or thinly covered with drift; consequently, even apparently sedentary soils are drift-contaminated. Over large areas the drift appears to be locally derived, but there are four other major deposits of till. Two drifts have encroached from the east, a drab grey, generally arenaceous till that is frequently overlain by a dark reddish-brown till of heavier texture. In the north, ice from the Cheviot Massif has been responsible for patches of drift in part derived from the Old Red Sandstone and associated measures. To the south, the Tyne Gap formed a relatively easy path for western ice to bring till from the Trias west of the Pennines and erratics from the Lake District and the Southern Uplands of Scotland.

The traverses on Sheet 19 are south of the Tyne Valley and run on a N.N.E.–S.S.W. line crossing the direction of ice-flow and the grain of the underlying strata of the Millstone Grit and the Scottish Carboniferous Series. The climate is of fundamental importance, and it appears that below 800 feet the soil-forming processes are critically balanced between podzolization and gleying. Frequently a change of process is noticeable with a change of management.

Several series have been recognized and mapped, and it is hoped to complete the traverses soon. (G. D. Ashley and C. C. Rudeforth.)

Yorkshire

Sheet 70 (Leeds)

The centre has been engaged on the final stages of the mapping of this sheet on the 6-inch scale. Early in the season an area was surveyed east of Leeds, where the soils are formed on Coal Measures little influenced by glacial drift. The dominant soil is formed on the Coal Measures Shale and is imperfectly drained. It is highly prized for specialized horticultural crops, notably rhubarb, flowering broccoli and, to a smaller extent, raspberries, strawberries and wallflowers.

The later part of the season was spent on the fluvio-glacial and lacustrine deposits in the Vale of York, mainly near Church Fenton. The alluvium of the lower Wharfe presented interesting problems. The deposited silt is highly calcareous, but those parts of the alluvial plain that are protected from flooding by embankments have become leached and have a history of progressively decreasing value as grazing land. The old and formerly well-founded tradition that these soils do not need liming has tended to discourage the application of lime after the need for it has become well marked. (A. Crompton and C. B. Crampton.)

Lancashire

Sheets 74 (Southport) and 83 (Formby)

The mapping of Sheet 74, comprising 44 sq. miles, is complete, and work is proceeding on Sheet 83. The mineral soils are mainly derived either from heavy-textured Triassic till, Shirdley Hill Sand or Estuarine–Freshwater Alluvium, and all correspond with those described from Sheet 75 (Preston). The substantial areas of peat have been mapped by systematic traverses, and it has been found that their depth ranges from a few inches to 20 feet. The peats are

https://doi.org/10.23637/ERADOC-1-117

of the Azonal type and developed initially under the influence of ground-water in basins and low-lying areas. Two main types of Basin Peat occur at the Low Moor Stage—Eutrophic and Oligotrophic—and a later stage of development under ombrogenous conditions has resulted in small areas approaching Raised Bog. The peats have been grouped into four main classes on their structural properties and botanical composition.

Grass–sedge peat. Eutrophic to mesotrophic basin peat which prior to draining and cultivation had reached a stable stage of Low Moor. Generally light coloured and of a fibrous texture, there are, however, marked variations due to local conditions.

Sphagnum–eriophorum peat. The depth of this generally fibrous peat rarely exceeds 2–3 feet, it is yellowish to reddish brown in colour and overlies grass–sedge peat. It represents peat growth from the period when the surface layers of eutrophic–mesotrophic basin peat rose above the influence of ground-water and further accumulation occurred under ombrogenous conditions. The marked change in vegetation often indicates development from Low Moor to pre-Raised Moss stage.

Eriophorum peat. This peat is generally dark brown in colour, has a tough fibrous texture and is oligotrophic throughout. The upper layers are often a mixture primarily composed of *Eriophorum* spp. associated with *Sphagnum* spp. and *Calluna vulgaris*.

Martin Mere peat. Silty, dark brown, amorphous peat with laminae of fine sand and silt. The organic fraction, derived from decomposing vegetation mixed with fine sand and silt, probably accumulated as a mud on the bed of the one-time lake. (B. R. Hall.)

Caernarvonshire

Sheets 94 (Llandudno) and 106 (Bangor)

The mapping of these sheets has been practically completed. The coastal strip had been mapped in detail in pre-war years, and only a few modifications have been necessary. Mapping was carried out along the western slopes of the Conway valley and extended into the foothills of the northern block of Snowdonia. Here a progressive admixture of igneous material, mainly acidic, somewhat modifies the soils from those derived purely from Ordovician and Silurian shales to the east. The change is gradual and somewhat capricious in such a strongly glaciated area of complex geology, and the little agricultural use made of these rather inaccessible foothills with high rainfall does not justify the labour of carefully separating soils of progressively greater admixture. Only soils of dominantly igneous origin have been separated from those developed on shales. In the mountains a reconnaissance survey gave a broad picture of the distribution of brown podzolic soils, peaty podzols, peaty gleys, peats and rock-dominant areas.

Much of the season was occupied with work on the memoir for Sheets 95 (Rhyl) and 107 (Denbigh), and some further sampling and local study was needed to clarify a few points. (D. F. Ball and J. F. Harrop.)

https://doi.org/10.23637/ERADOC-1-117

Derbyshire

Sheet 125 (Derby)

Several outbreaks of foot-and-mouth disease occurred in this area during August and September. At the request of the Provincial Director of the National Agricultural Advisory Service, and to avoid any risk of spreading the disease, surveying was discontinued for six weeks. As a result, the area surveyed, 45 sq. miles, was less than originally planned.

Mapping was mainly confined to the west of the Derwent, where parent materials of Triassic and Carboniferous ages occur. The variation in parent material was found to be reflected not only in the soil morphology but also in the resulting agricultural pattern. Lithological differences, combined with small changes in relief and climate, have led to the formation, in the main, of brown earths of high base status in the Triassic area, while brown earths of low base status, peaty podzols and gley soils characterize the Carboniferous area. (J. H. James, L. F. Curtis and J. P. Watson.)

Shropshire

Sheet 166 (Church Stretton)

Surveys have been made of two principal geological areas: (1) the Uriconian Hills and associated Lower Palaeozoic sediments, and (2) the Old Red Sandstone beds of Corvedale and the Dittonian Platform. Of the 26 sq. miles mapped, approximately 13 sq. miles have been completed in each district.

The Uriconian Hills of Caer Caradoc, Lawley, Ragleth and Hope Bowdler are generally steep-sided, and the soils are shallow, light-textured brown earths. Flanking the lower slopes are the more readily weathered Lower Palaeozoic sandstones and shales on which deeper soils are found, and the gentler slopes encourage arable cultivation. Where, however, shales are dominant, the soils are gleyed and good field drainage is essential. Small isolated patches of northern drift (a common deposit on the lower ground) are found at 1,000 feet and are testimony to its former wider extent.

Mapping in Lower Corvedale is not complete, but a complex series of east–west alluvial channels has been found linking the alluvial flats of the Corve and Pye Brook with deep indentations in the Dittonian escarpment. The soils developed on alluvium vary greatly in texture, but generally are not gleyed. Soils derived from the Ledbury marls, underlying the alluvium and exposed only in isolated ridges and hills, have the general characteristics of the Bromyard series, although the parent material is highly calcareous. (D. Mackney.)

Cambridgeshire

Sheet 173 (Ely)

One member of the team was seconded to the Somaliland Government for six months and returned to the United Kingdom in April to write a report on the work. The examination of thin sections and mineralogical preparations, as well as the preparation of the map and memoir of Sheet 188 (Cambridge), has occupied a consider-

https://doi.org/10.23637/ERADOC-1-117

able amount of time, and for the greater part of the year only one surveyor has been working on Sheet 173, of which about 10 sq. miles north of Isleham have been surveyed. Here peat soils developed on the " fen clay ", an estuarine deposit interbedded in the peat, were encountered for the first time. Other soils include the Worlington series on a light, sandy parent material and complex areas of sand soils and peats. (C. A. H. Hodge and R. S. Seale.)

Oxfordshire

Sheet 201 (*Banbury*)

A detailed reconnaissance survey of 36 sq. miles between Banbury and Edge Hill in North Oxfordshire has been completed, using air-photos as base maps. The area is characterized by a moderately dissected plateau of Middle Lias ironstone, which gives rise to a uniform soil type corresponding to Kubiena's Ferritic Braunerde. The soils in the valleys are developed on ironstone colluvium and Middle and Lower Lias silts and clays. Several soil types named by G. R. Clarke on Sheet 218, which adjoins, have been mapped in the area. (R. R. Storrier.)

Hertfordshire and Buckinghamshire

Sheet 238 (*Aylesbury*)

Extensive revision of earlier work has been undertaken, and fifty-two representative profiles have been described and sampled for analysis. A 2½-inch map of the sheet is being prepared; this enables the soil pattern to be seen more effectively than the 6-inch field slips and facilitates the final reduction to the publication scale of 1 inch to 1 mile. (B. W. Avery, D. W. King and A. J. Thomasson.)

Somerset

Sheet 280 (*Wells*)

Forty sq. miles were mapped along the northern margin between Congresbury and Chew Stoke and in the area between Compton Martin and Paulton. Apart from isolated Lias-capped hills, the geological formations are mainly of the Keuper, consisting of marls in the west and becoming gradually more sandy in an easterly direction.

In the Vale of Wrington, where gravels derived from the Mendip Hills overlie the marl, the Langford series occurs where the gravel is thick and drainage is free. Around Stock and Brinsea these deposits become thin and two gley soils occur—an imperfectly to poorly drained sandy loam and a poorly to very poorly drained heavier-textured soil with a peaty surface in places. Similar soils were found around Ubley, where cherty gravel overlies the marl. East of Butcombe and Ubley, where the Keuper formation contains more fine sandy bands, freely drained soils resembling the Hodnet series of the Midlands occur, together with a poorly drained counterpart on flat and depressed sites. Approaching the Coal Measures outcrops around Temple Cloud, the Keuper formation becomes more sandy and bright red in colour. It may be possible to correlate the

https://doi.org/10.23637/ERADOC-1-117

deep, freely drained soil developed with a soil also described from the Midlands. (D. C. Findlay and B. Clayden.)

Kent

Sheet 305 (Folkestone)

Surveying was continued to Guldeford Level and the remainder of Wallend Marsh, together comprising about 30 sq. miles. These are the younger parts of Romney Marsh, reclaimed piecemeal over many centuries, and an initial rapid survey of innings walls and natural features, such as creeks, fleets and channels, yielded information regarding the genesis and historical development of the area which greatly facilitated later work. Man and Nature have influenced each other to a marked degree, and the features mentioned are important in determining the relief and the deposition of deposits of widely different texture. Several score miles of innings walls were tracked and mapped, many of them proving to be important soil boundaries. This phase was followed by semi-reconnaissance soil mapping, and all but a few thousand acres have now been surveyed on this basis. (R. D. Green.)

Other Work

A reconnaissance map of the soils of Guernsey was prepared at the request of the Horticultural Officer. Four soil regions were recognized on a topographical basis. Generally, the higher parts are covered by " limon ", giving rise to freely drained loams, silty where the deposit is thick and gritty where it is directly influenced by the underlying metamorphic rocks. Below 75 feet O.D. fine, sandy soils are associated with old raised beaches passing, nearer the sea, to a littoral zone characterized by wet, coarse sandy soils and small areas of peat. (D. W. King.)

The sites of thirty-one field experiments carried out on commercial farms by the Chemistry Department were examined with a view to characterizing and classifying the soils. (B. W. Avery, D. W. King, A. J. Thomasson, L. F. Curtis and C. A. H. Hodge.)

An excursion to the Chilterns and the Vale of Aylesbury was organized in connection with the Summer Conference at Reading of the British Society of Soil Science. (B. W. Avery, D. W. King, A. J. Thomasson and C. L. Bascomb.)

A survey was made of a large commercial farm on which fertilizer experiments are to be laid out at Levington, Suffolk. (C. A. H. Hodge and R. S. Seale.)

Work has continued on the weathering of limestone. Early results suggest a relationship between the size of the block, the absorption expressed as a percentage of dry weight and the amount of shattering. (J. H. James.)

At the request of the National Agricultural Advisory Service observations on soil structure and other aspects of soil formation were made on restored ironstone workings. Advice was also given on water supplies to the Drainage and Water Supplies Division of the Derbyshire Agricultural Executive Committee. (J. H. James.)

Several profile examinations and some experiments have been

https://doi.org/10.23637/ERADOC-1-117

made on clay soils found, by Dr. E. C. Childs and his colleagues, to be highly permeable with regard to ground-water. Some crop-yield experiments have been carried out on two soils under identical management. Water-table levels have been regularly measured for a variety of soils. (R. D. Green.)

https://doi.org/10.23637/ERADOC-1-117