

The Land Utilisation Survey of Britain

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AFTER about a year spent in preliminary experiment, the Land Utilisation Survey of Britain, aided by an initial grant from the Rockefeller Research Foundation administered by the London School of Economics, began work with the appointment of its first organising secretary in October 1930. The genesis of the scheme, its aims and objects, have been explained at some length in papers read before the Royal Geographi-

cal Society¹ and the Royal Scottish Geographical Society.² It may be said very simply that the aim of the Survey is to make a cartographical record, complete for the whole of Great Britain and referring to the years 1931 and 1932, of the uses to which the surface of the country is being placed at the present time.

the discretion of the surveyor whether each piece of land is merely marked with the initial letter, as given below, or lightly coloured.

(1) Forest and woodland, marked F; if coloured, a dark green. Forests and woodlands are already marked on the six-inch maps, but it is necessary, especially where the maps are rather out of date, that each area should be checked, and special care is required to include newly planted areas. After

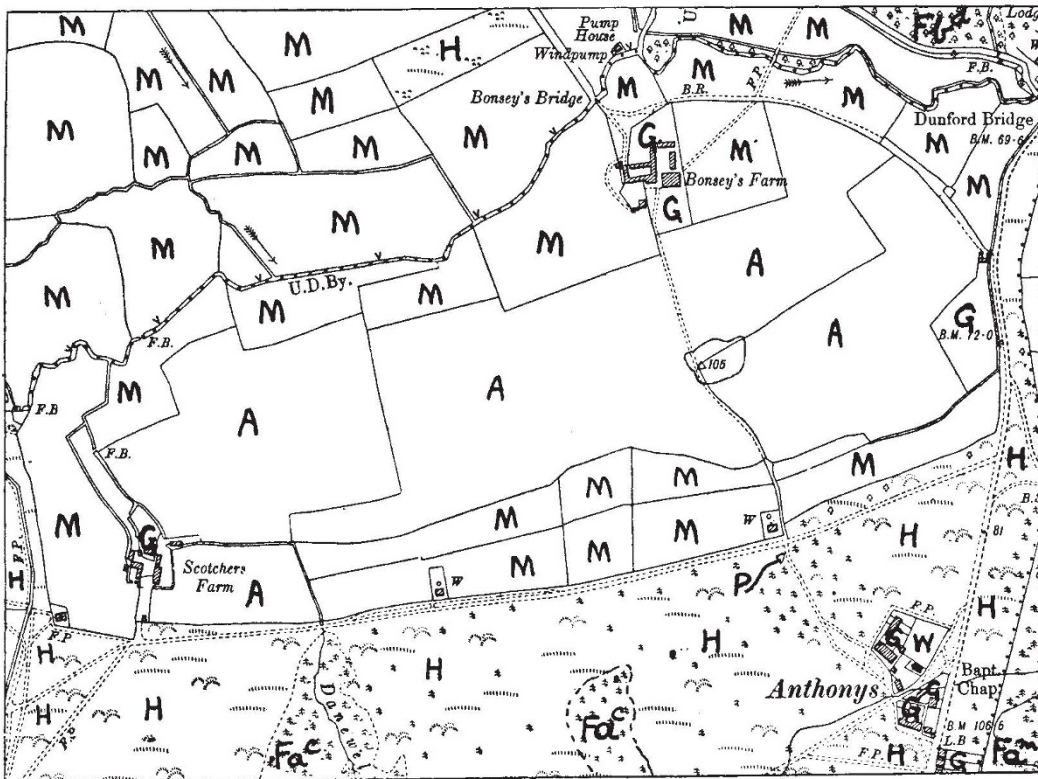


FIG. 1.—Portion of Ordnance Survey map, 6 in. to 1 mile, with lettering inserted by Land Utilisation Survey. (Reproduced by permission.)

The record is being made on the maps published by the Ordnance Survey on the scale of six inches to the mile, since on these maps every individual field is already marked (Fig. 1). There are the equivalent of about 22,000 quarter-sheets of these maps, each representing six square miles, to be covered for the whole of Britain, and, broadly speaking, each quarter-sheet requires about two days' work. After a number of preliminary experiments, the following simple classification was adopted. It may be mentioned that it was left to

consultation with the Forestry Commission, the following classification of forests was adopted: (a) High forest—big trees sufficiently close for their crowns to touch, and useful for timber production. (b) Coppice, or coppice with standards—woodland that is cut over every few years for fencing, posts, etc. (c) Scrub—small bushes or trees unfit for cutting. (d) Forest felled and not replanted. Thus each piece of forest or woodland has a lettering, *Fa*, *Fb*, *Fc*, and *Fd*, and it is then also possible to distinguish coniferous, *c*, deciduous, *d*, and mixed, *m* (*Fa^c*, etc.).

(2) Meadowland and permanent grass, marked *M* and coloured light green. It is important that rotation grass should be excluded from this category.

(3) Arable or tilled land, including rotation grass and fallow, marked *A* and coloured brown.

Some areas of arable land are quite definitely used as market gardens, which are then further distinguished by the letters *MG*, but it was not felt possible to make a separate category for market

marked *G* and coloured light purple. Houses with gardens sufficiently large to grow a few vegetables or even flowers come in this category, because the area, though producing comparatively little, is still productive. Allotments are included in this category since they are merely gardens at a distance from the worker's house. Orchards are usually separately distinguished on the six-inch map, and so the symbol *G* readily distinguishes them; but if the ground is used for grazing, the symbols may be combined *GM*, or where used for fruit and ground crops *GA*.

(6) Land agriculturally unproductive, marked *W* and coloured red. This category includes not only buildings, yards, mines, cemeteries, etc., but also purely waste land. Many enthusiastic surveyors have been able to add a great deal to our knowledge of the utilisation of the countryside by definitely stating what is the actual character of land marked *W* on their maps.

It will be seen that the scheme is a simple one, and for that reason the survey is being carried out very largely by school children, as an educational exercise, in all parts of the country. Indeed, it may be said that the Land Utilisation Survey has two aspects and two objects. The first is the value of the work as an educational exercise, and the whole idea grew originally out of the work of the Regional Survey Committee of the Geographical Association. The more progressive schools throughout the country have for many years been carrying out local regional surveys, and on all hands it was obvious that the training in accurate observation which was entailed and the interest in local environment which was aroused—and invariably led to a remarkable realisation of civic consciousness—afforded an objective in itself. It was only to be regretted that all the rising generation should not be able to share in such an

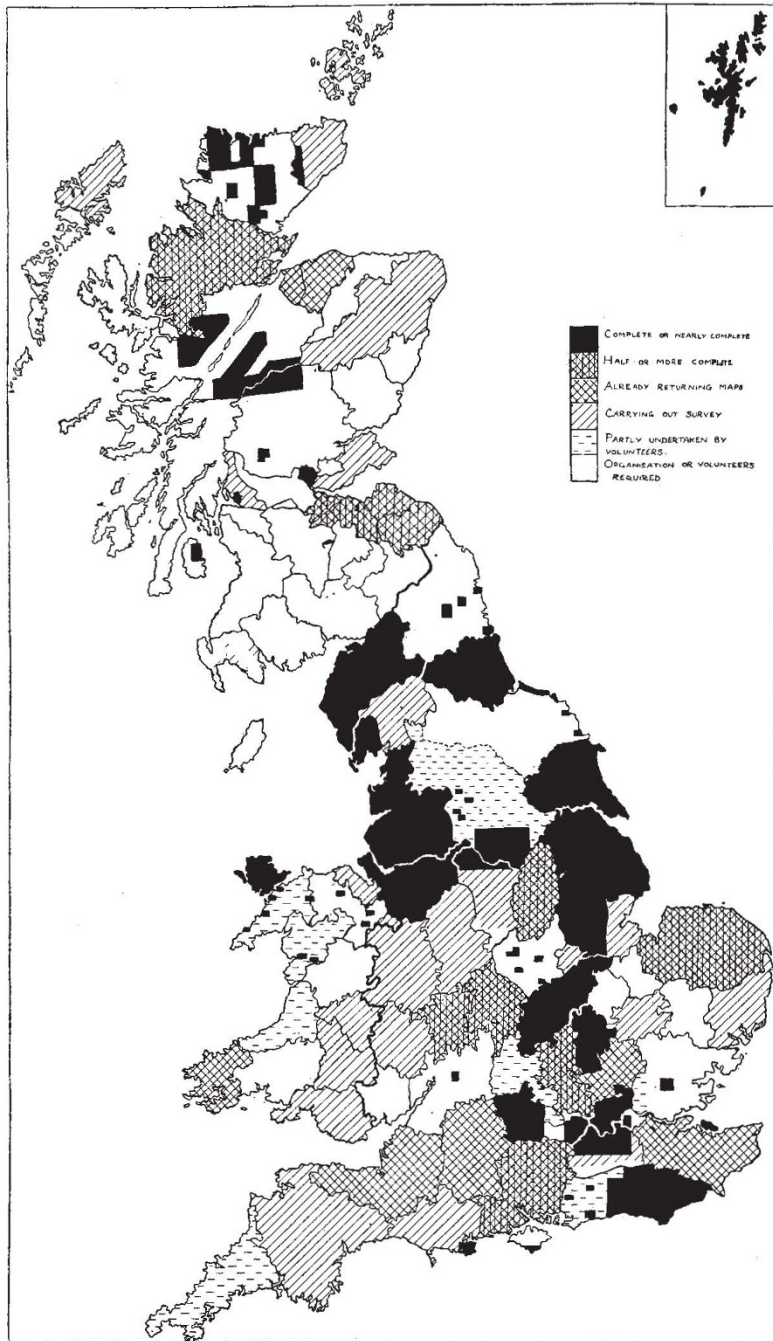


FIG. 2.—State of Land Utilisation Survey of Great Britain to Feb. 18, 1932.

gardens, because numbers of tracts of arable land are only used for market gardening purposes occasionally.

(4) Heathland, moorland, commons, and rough hill pasture, including swamp and marsh pasture. These are marked *H* and coloured yellow.

(5) Gardens, allotments, orchards, and nurseries,

exercise. Hence it was felt that if a nation-wide survey on simple lines could be organised it would heighten the value of existing regional surveys and give a new incentive to those who had not yet undertaken such work, by permitting the participants to realise that they were really doing part of a great nation-wide work.

It may be said at once that the enthusiasm with which the scheme was received by educational authorities almost throughout Great Britain has been remarkable, and about two-thirds of the counties of England and Wales have been organised locally by directors of education. As the accompanying map (Fig. 2) shows, large areas have been completed, and testimony is unanimous as to the educational value of the work.

In the second place, there is the permanent value of such a survey. It must be said at the outset that the Land Utilisation Survey is an entirely independent body and has no connexion with any government department or with any political party, and that the inception of the scheme at a time when land valuation was a subject for Parliamentary discussion was purely accidental. Despite the rapidity with which changes in agricultural practice in Great Britain are taking place—for example, there is now less than half the area under the plough that there was fifty years ago—it is a fact that no record is available as to the exact areas over which the changes are happening. Statistics are available on a county basis and, in manuscript, on a parish basis, but in the absence of cartographical record it is impossible to evaluate the relative importance of the factors which are causing the change in a given locality. In some areas it may be soil, in others climate. It may be elevation or aspect, accessibility, or merely the progressiveness or lack of progressiveness, as the case may be, on the part of the farmer that has determined the changes in local agricultural practice. It is certain that, if a record of this character can be made for the whole of Great Britain, agricultural economists in the future will have an important basis on which to work.

It has been urged that the volunteer observers lack the training with which to make sufficiently accurate observations. To this there are several answers. In the first place, the scheme is a simple one, and on all hands where there are difficult points the advice of the farmers themselves is being sought and given willingly. In the second place, there is a ready check, in that separate sheets

of the six-inch map by different surveyors must fit along the edges where they join, and if there is a disparity in observation, this is at once apparent. In the third place, trained observers are checking the results as they are obtained by making traverses across the sheets.

The map reproduced as Fig. 2 shows the present state of the work. Two things deserve emphasis. First, thanks are due to those who have so nobly assisted up to the present date, when more than four thousand sheets have been completed and returned to the central office; but there are still gaps in the scheme, and in a number of cases the organisation of a whole county is a matter of most urgent necessity. Broadly speaking, it is found that there must be at least one really keen person on the spot for the work to be successful. It is obvious also that any serious delay in the completion of remaining tracts will cause work already done to be vitiated to a considerable extent; for, to be of value, the record should be complete for the years 1931 and 1932. In many of the areas shown on the map as in charge of volunteers there is the need for additional volunteers to fill in remaining tracts. It may be said that the maps are supplied at a reduced rate of 1s. 6d. each to those volunteers who wish to keep them when completed. They are merely forwarded to the central office and there copied by a photostat process. The maps themselves are retained at the central office if the surveyor does not wish to purchase them.

The Survey's headquarters are at 18 Houghton Street, W.C.2, and are open daily from 10 to 5, and inquiries are welcomed, by letter and in person. The secretary is Mr. E. C. Willatts, and the advisory committee of the Survey includes representatives from the London School of Economics (in the person of Sir William Beveridge), the Ordnance Survey, the Land Agents' Society, the County Councils Association, the Boy Scouts' Association, whilst agriculturists are represented by the director of Rothamsted Experimental Station (Sir John Russell).

¹ *Geographical J.*, 78, July 1931.

² *Scottish Geographical Mag.*, 47, May 1931.

Vortex Motion in Vibrating Columns of Air

ONE of the most familiar and fascinating experiments in acoustics is that initiated by Kundt in 1866, in which the vibrations of an air column enclosed in a glass tube are revealed by means of a fine powder such as cork or lycopodium. Almost everyone is familiar with the manner in which the dust collects in little heaps at the nodes, thereby providing a simple means of estimating the velocity of sound in the gas enclosed in the tube.

An interesting secondary phenomenon also is the formation of a series of ridges or striations of dust lying across the axis of the tube. An attempt to explain this peculiar formation was made in 1891 by W. König. His theory, based on attractions and repulsions between spheres in a vibrating fluid, was universally accepted until the present

time. Even Rayleigh found nothing in it to criticise.

In two papers recently published,* Prof. E. N. da C. Andrade has thrown fresh light on the subject in a somewhat startling manner. In the older experiments the observations of the striations were always made under static conditions, that is, after the air vibration had ceased, instead of in the dynamic state whilst the air was in vibration. Not only this, but also the method of excitation was not always maintained for a period sufficiently long for the motion to reach a final stable condition, nor was the amplitude of excitation kept uniform. Prof. Andrade remedies all these defects in

* *Proc. Roy. Soc., A*, 134, pp. 445-470; 1931; and *Phil. Trans. Roy. Soc., A*, 230, pp. 413-445; 1932.