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WELSH AGRICULTURAL LAND SUB-COMMISSION

AGRICULTURE ACT 1947

Borth Bog Investigation REPORT

LONDON : HER MAJESTY'S STATIONERY OFFICE
1952

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BORTH BOG INVESTIGATION

To the Right Honourable TOM WILLIAMS, M.P.,
Minister of Agriculture and Fisheries.

SIR,

1. On May 11, 1948, you referred to the Agricultural Land Commission some 2,500 acres of Borth Bog in the County of Cardigan for an investigation under Section 84 of the Agriculture Act, 1947, in the following terms:

Enactment under which Reference is made

(i) Section 84 (1) (a) and (b) of the Agriculture Act, 1947, provides that where the Minister is satisfied in the case of any agricultural land that the full and efficient use of the land for agriculture is being or will be prevented if work is not carried out or fixed equipment is not provided or existing fixed equipment thereon is not maintained, and that having regard to the nature of the work or equipment required or of the existing fixed equipment it cannot reasonably be expected to be carried out, provided or maintained unless the Minister exercises his powers under this sub-section, he may acquire the land, or any part thereof, by compulsory purchase or by hiring for the purpose of maintaining existing fixed equipment.

(ii) Sub-section (2) of Section 84 provides that, before proceeding with the acquisition of land under this Section of the Act, the Minister shall refer to the Agricultural Land Commission for their report thereon the question whether the conditions are fulfilled as to which the Minister must be satisfied before acquiring the land.

Subject-matter of Reference

(iii) Borth Bog lies between the shores of Cardigan Bay and the high road from Aberystwyth and Machynlleth. A considerable area at the southern end is almost worthless from an agricultural point of view, but early in the war, the Cardigan War Agricultural Executive Committee suggested that some 2,500 acres in the vicinity of the River Cletwr, the River Dovey and the Ynyslas-Llancynfelin Road, if properly drained, would yield increased food production immediately. The Committee's recommendation that a land drainage scheme be carried out was approved by the Minister under Defence Regulation 50 in April, 1942. At a cost of £61,000 sea embankments were raised and strengthened, flood embankments on the banks of the Rivers Cletwr, Ddu and Leri were constructed and the internal drains of the area improved generally. The capital appreciation of the land within the benefit area was subsequently assessed at £7,000.

(iv) It had been expected that once the capital works had been completed responsibility for their maintenance would pass from the Ministry to the Borth Drainage Board which had been constituted under the Land Drainage Act, 1930. The Board declined to function, however, as members considered that the cost of maintaining the drainage works would be beyond any resources they could command. The Ministry was faced, therefore, with the alternatives of abandoning the Works, or of assuming responsibility for drainage maintenance by purchase of the area of benefit or otherwise. Treasury authority was obtained to carry out maintenance pending a final decision as to the future ownership and use of the area. A Resident Engineer was appointed to supervise the necessary works. Even if the problem of future maintenance could be solved otherwise than by State purchase there remains the further problem of ensuring that the land is fully and efficiently used for agriculture. The area of benefit is divided up into approximately 50 parcels, and it may not be possible to secure the full use of the land's increased potentialities for food production without placing a large part of

the area under unitary control and providing additional equipment. Better drainage does not so far appear to have secured a high degree of improvement over the whole of the benefit area but upwards of 1,500 acres are capable of producing good arable crops, or of being used as first class grazing if properly farmed. It may be that the failure to maintain the work undertaken in the area in 1919 has caused owners to be sceptical of the value of the work carried out since 1942. There is evidence in the area that owners and occupiers alike consider that any profit they may obtain from the increased productivity of the land will be insufficient to meet the cost of their share of past capital works and future maintenance.

Terms of Reference

(v) The Agricultural Land Commission are, therefore, asked to investigate and report upon the area delineated on the accompanying map, and known as Borth Bog, in accordance with the provisions of Sub-sections (2) to (5) of Section 84 of the Agriculture Act and to express their considered opinion whether there is a case in the national interest for the Minister to exercise his powers of compulsory purchase under Section 84 so far as this part of Borth Bog is concerned.

2. In accordance with Sub-section (5) of Section 68 of the Agriculture Act, the Agricultural Land Commission delegated to the Welsh Agricultural Land Sub-Commission their functions under Section 84 of the Act in so far as Wales and Monmouthshire are concerned. We, the Welsh Agricultural Land Sub-Commission, have, therefore, the honour of submitting this report upon our investigations into the agricultural future of Borth Bog.

SECTION I. INTRODUCTION

(i) PROCEDURE

3. Sub-section (3) of Section 84 of the Agriculture Act, 1947, provides that "on such reference the Commission, after inspecting the land in question and making such other enquiries as appear to them requisite, shall prepare a draft report to the Minister on the question referred to them." We have inspected Borth Bog on several occasions, and during the course of our visits we met most of the occupiers and many of the owners of the land. We were naturally anxious to take advantage of the knowledge of those having intimate acquaintance with Borth Bog, and we therefore held informal meetings with the

Cardiganshire Agricultural Executive Committee

Aberystwyth Rural District Council

Owners and occupiers of land in Borth Bog

Agricultural Economics Department of the University College of Wales.

We also received written observations from the Country Landowners' Association (Carmarthenshire and Cardiganshire Branch); from the Transport and General Workers' Union (West Wales District); from the National Union of Agricultural Workers (after consideration by a Conference of delegates from its branches in Cardiganshire, Pembrokeshire and Carmarthenshire); and from the Cardiganshire Branch of the National Farmers' Union.

4. We gratefully acknowledge the courtesy and assistance of all with whom we came into contact during the investigation. All views expressed to us have been carefully considered in arriving at our own conclusions and recommendations which are set out later in this report.

5. In pursuance of Sub-section (4) of Section 84 of the Act, notices were inserted in two successive weekly issues of the *Liverpool Daily Post*, *Western Mail*, *Farmer and Stock-Breeder*, *Farmers' Weekly*, *Welsh Gazette* and

Cambrian News, informing owners, lessees and occupiers of land in the area under reference that the draft of this report was available on application. Owners, lessees and occupiers were given six weeks from the first publication of the notice in which to make written representations in regard to the contents of the draft report, or to inform us of their desire to submit their views orally at a time and place to be arranged. Representations in writing were received and we heard further representations on behalf of owners and occupiers at the Town Hall, Aberystwyth, on October 24, 1950. After consideration of the representations and in the light of changes that have taken place since our draft report was prepared, we have included certain amendments and modifications in this report.

(ii) DESCRIPTION OF AREA

6. Borth Bog, or Cors Fochno, has received considerable attention from time to time. In "The History and Antiquities of the County of Cardigan", Samuel Rush Meyrick (1783-1848) in discussing the state of agriculture at that period mentions that:

"On the coast beyond Aberystwyth, bordering on the River Dovey, there is a similar extensive tract, that, for a total drainage, is perhaps subject to a greater disadvantage (than Tregaron Bog). It has, however, been partially done on that side nearest Aberystwyth, and a good road made over it from Llanfihangel Gneu'r Glyn to Borth. It is said of this waste that one-third would be excellent if drained, and one-third tolerable, and the last third never good for anything."

The Land Reclamation Society in their annual report of December, 1915, write as follows:

"Another area inspected but not surveyed is Borth Bog. This comprises a tract of several square miles of alluvial land . . . no survey of this property has yet been made, but on the face of it, and unless unforeseen difficulties discover themselves, it is a simple engineering problem and an exceedingly valuable area should be made available for agriculture by the execution of drainage works."

7. Many investigations into the geological and botanical character of the Bog have been carried out under the auspices of the University College of Wales, Aberystwyth, including an exhaustive Study by Professors O. T. Jones and Yapp and Mr. D. Johns published in the *Journal of Ecology*, 1916-17 (Vol. IV. Part 1 and Vol. V. Part 2) under the title "The Salt Marshes of the Dovey Estuary". These researches have been both interesting and helpful in our present investigation.

8. Borth Bog lies on the estuarine flats of the southern shore of the River Dovey and probably came into being as a result of the formation of a storm beach. As will be seen from the plan accompanying this report, the Bog is bounded to the north by the Estuary, to the west by Cardigan Bay and to the south-east by the Aberystwyth—Machynlleth road with uplands behind rising abruptly to a height of about 1,000 ft. The Bog as a whole consists of some 6,000 acres but the southern part of the area is still peat bog of little agricultural value, and the area referred to the Sub-Commission comprises a relatively narrow strip of from half-a-mile in width, which runs alongside the Dovey Estuary for some 5 miles in a north-easterly direction. The whole area is naturally very low lying, most of it being between the 10 and 20 ft. contours, although there are outcrops forming two rocky islands rising about the 50 ft. contour, which have been excluded from our terms of reference. The area is traversed by three rivers, the Leri, the Cletwr, and the Ddu, which carry to the sea the water from the uplands which fringe the Bog.

SECTION II. PRESENT AGRICULTURAL USE AND THE SOILS OF BORTH BOG

(i) PRESENT SYSTEM OF FARMING AND FARM STRUCTURE

9. From the classification in the Appendix it will be seen that the area with which we are concerned consists of:

- (a) a small number of comparatively large economic units, many of them only partly in the reference area;
- (b) a fair number of small uneconomic units again with many of them only partly in the area;
- (c) a large number of detached units of accommodation land, by-takes, etc., the individual units being small in area.

The present system is in general that of mixed farming with emphasis on stock-rearing, combined on many of the holdings with milk-production. The relation between the land inside and outside the reference area is of importance as is shown by the tables in the Appendix.

10. At the time of the inspection only 200 acres of the land within the reference area was under tillage and there was approximately 1,000 acres of grass and 1,100 acres of rough grazing, making a total of some 2,300 acres of agricultural land. The livestock population, corrected for the reference area, was about 530 cattle (including 130 dairy cows) and approximately 600 sheep, not a high figure for this acreage. It is fair to point out that these are the figures for September when livestock population in the area is at its lowest.

11. Where the unit is an equipped farm, it is usually within a ring fence. There are no serious problems of severance or in connection with the lay-out of such farms which for their size is reasonably convenient. There are:

- 13 owners
- 19 owner-occupiers
- 18 tenant farmers
- 3 units of common land.

Formerly two large estates, namely Gogerddan and Gwynfryn, owned practically the whole of the reference area. These are now very much reduced in size, the Gogerddan estate owning approximately 543 acres and Gwynfryn 416 acres. The other owners—excepting the owner-occupiers—are persons often living at some distance from the area and, generally speaking, owning only comparatively small areas. The sub-division into small units as described has an obvious bearing upon the drainage, management and farming of the area.

(ii) SOILS

12. Apart from the nature of the soils, the physical characteristics of the Bog, such as exposure, rainfall and temperature, are fairly uniform. The variation in the soil is shown in the soil survey carried out by officers of the National Agricultural Advisory Service, of which we have made full use in compiling this report. Broadly speaking, the soils of this area are either alluvial—deprived from estuarine sediments—or peat. In many places the upper layers of the peats have been considerably modified by the deposition of mineral sediments subsequent to the original peat formation. In a few places some slight peat formation on the alluvial deposits has occurred, but such areas are small in extent and of relatively little importance.

13. The soils may be divided into 4 main groups, according to the character of the upper layer of 2 or 3 feet in depth.

- (i) Alluvium
- (ii) Peat
- (iii) Peaty loam overlying peat
- (iv) Alluvium overlying peat

The distribution and extent of these four types are shown on the accompanying soil map of the reference area. The two other types shown on the map concern only small acreages.

14. *Alluvium.* The largest area of alluvium lies to the south of the embankment from Ynyslas Station to Rhostwrc. In general this soil is rather heavy in character consisting mainly of silt and clay and with less than 10 per cent of organic matter. For this reason, it is not generally very suitable for arable farming—but with proper manuring and good management it would produce excellent leys. At the present time these alluvial soils are somewhat deficient in lime, the average lime requirement being 20-25 cwt. per acre of burnt lime or 34-40 cwt. per acre of ground limestone. They are low or medium in phosphate, the better pastures of course showing the higher phosphate content. In general they are reasonably satisfactory in potash. From the manurial point of view, liming followed by frequent dressings of phosphate and an occasional dressing of potash should ensure high productivity.

15. *Peats.* Peats, or fairly peaty soils, cover a good part of the area. They vary considerably in the relative amounts of mineral and organic matter, the latter being from about 30 per cent to 70 per cent. Where drainage conditions have been improved, considerable success has been achieved by some farmers in reclaiming these peats. In their natural condition these peats are so acid that they require an initial dressing of 2 tons per acre of burnt lime or 3½ tons per acre of ground limestone, followed by a smaller surface dressing of ground limestone in about 3 years' time. They are invariably very low in phosphate and, in addition to a fairly heavy dressing of phosphate during reclamation, they should receive further frequent dressings if a good sward is to be maintained. Their potash content is satisfactory and is often high. Where drainage has been improved with the consequent lowering of the water table it should be possible to develop reasonably productive swards on most of these peats. It is, however, important when reclaiming these soils that adequate dressings of lime and phosphate be applied.

16. *Peaty loams and Alluvium overlying peat* occur in various places on the borders of the peat and alluvial areas. Most of these soils have been under the plough at some time. Because of the high proportion of mineral matter in the upper layers, they should be capable of higher production, and should be more easily managed than the more peaty soils provided that good drainage conditions are maintained. Their lime requirement varies according to past treatment from 10-40 cwt. per acre of burnt lime or 20-60 cwt. per acre of ground limestone. A similar variation is found in their phosphate content. Where they have not received recent dressings they are all low, or very low, in phosphate. Their potash content is reasonably satisfactory.

SECTION III. SEA DEFENCE AND THE EXISTING DRAINAGE PATTERN

17. The key to the continued use of Borth Bog for agriculture is the maintenance of the sea walls or tidal embankments which have been constructed along the Dovey estuary and continued for some distance on either side of the tidal rivers Leri, Cletwr and Ddu. The railway embankment protects the area against the sea for a distance of some three miles and although the embankment is rather porous and the sea seeps through at periods of very high tides, the water is satisfactorily carried to the outfalls by the drainage channels. In addition to the railway embankment, there are altogether over seven miles of tidal embankments which have been improved or re-constructed during the reclamation scheme which the Cardigan Agricultural Executive Committee carried out during 1942-1946.

18. Except for a few short lengths these tidal embankments are on a peat foundation and are constructed for the most part of peat with, occasionally, some silt. These materials, which are obtained from what are known as "borrow pits" at the rear of the embankments, are hardly stable enough to cope with wave action. They are given protection from the action of high tides by a complete covering of turf except in the case of the Dovey sea wall—the lower parts of which are protected by stone.

19. Behind the sea embankments a network of water-courses drains the Bog and the water is discharged into the tidal rivers by outfall culverts. The "borrow pits" are at the rear of the sea wall; these pits have been connected with the drainage system in order to act as reservoirs when the outfall flaps are closed by the tide and the surface water is unable to escape. Under the reclamation scheme referred to above, main drains and farm ditches were cleansed or improved—to avoid the construction of an additional embankment, a new drain of nearly one mile in length was constructed parallel to the railway line and eastward of the Ddu outfall to carry water which previously was discharged into the breakwall outfall. The length of all the drains in the system covering the area referred to us is as follows:

| | | | | |
|-----------------------|-----|-----|-----|--------------|
| Main drains | ... | ... | ... | 1,546 chains |
| Farm ditches | ... | ... | ... | 2,347 " |
| "Borrow pit" channels | ... | ... | ... | 548 " |
| Total | ... | ... | ... | 4,441 chains |

or 55½ miles—a considerable length for an area of this size. The pattern of the drainage system is shown on the plan accompanying this report.

SECTION IV. THE PROBLEM

20. We have felt it desirable to set out briefly the present position in the Bog as a background to the problem referred to us under Section 84 of the Agriculture Act. This problem falls into three sections:

- (a) What is the full and efficient use of Borth Bog for agriculture;
- (b) Is the full and efficient use being prevented by
 - (i) work not being carried out or fixed equipment not being provided, or
 - (ii) existing fixed equipment not being maintained.
- (c) And, if so, any work or fixed equipment considered necessary for the full and efficient use be carried out, provided or maintained without the Minister exercising his powers of compulsory acquisition.

SECTION V. FULL AND EFFICIENT USE OF BORTH BOG

21. We have fully considered the conditions affecting production on Borth Bog, particularly drainage and soils, and we are convinced that production from this area can be substantially increased. Under proper management the alluvium, alluvium-on-peat and peaty loams are—in our opinion—capable of carrying one beast or its equivalent to the acre. This is in fact being maintained at present on some of the better-managed farms on this type of soil. There are in all approximately 900 acres of these soils within the reference area that would at this rate carry 900 cattle. The peat area, on the other hand, is not generally well farmed, but with efficient management it should carry one cattle-unit on every 3 acres.

Elsewhere, where the soil is very peaty and acid in character, one cattle-unit on every 5 acres would be the probable basis. This means that, with efficient management, some 1,300 mature cattle or their equivalent in young stock and sheep could be carried on the whole of the reference area. As today the number of cattle-units is much below this figure there is scope for considerable expansion in the stock-carrying capacity of the area. If the embankments and drainage are not properly maintained, conditions will rapidly deteriorate until a position is reached when only a small number of livestock can be carried on what would then be ordinary saltings.

22. With this increase in production in mind, we have given careful consideration to the type of farming that should be adopted on the area referred to us.

Our view is that the Bog should be farmed on a ley system with a large proportion under grass, and with emphasis on milk and fat-lamb production. The length of the ley will depend to a large extent on the soil conditions. On the alluvial soil, for instance, once a good ley has been established, we should not expect it to be broken up again for a considerable number of years, the soil being capable of producing excellent pasture very suitable for dairying. With the provision of modern buildings and a piped water supply, we envisage an extension of milk production in this particular area—it has the advantage of being accessible to markets and well served in the matter of roads.

We appreciate that on the peaty soils the establishment of a good sward may not be so easy. Re-seeding has been attempted on some of the farms, but it is clear that—even when the land has been thoroughly prepared—successive re-seedings may be necessary before a really satisfactory sward can be established. In this connection experience suggests that direct re-seeding in late summer gives better results than re-seeding under a nurse crop. Re-seeded pastures on this land are liable to get badly poached and should not be grazed except by sheep or young stock.

Where the peat has an alluvial content, tillage produces a medium loam which is very suitable for arable cultivation, and on which re-seeding also gives excellent results. Here a larger proportion of the land should be under arable crops during the rotation; we are of the opinion that some, at least, of the arable land might be devoted to the production of potatoes and horticultural crops, to meet local demand during the holiday season.

23. In view of the differences in soil character, we think it is desirable that there should—as far as practicable—be some of each soil type on each farm unit, so that it should be possible to maintain a reasonable acreage of tillage on the farm and thus ensure increased production—not only from the area under the plough but also by raising the stock-carrying capacity of the land under grass in the ley system much above that of the very poor existing permanent pasture. We refer to this again in Paragraph 30.

SECTION VI. CONDITIONS FOR FULL AND EFFICIENT PRODUCTION

24. We now come to the main objective of our investigation, i.e., what is necessary in the way of work and fixed equipment for the full and efficient agricultural use of Borth Bog. This can be considered under three main headings:

- (i) Sea defences and land drainage
- (ii) Layout and size of holdings
- (iii) Fixed equipment (buildings, roads and water supply)

(i) SEA DEFENCES AND LAND DRAINAGE

25. We have already given a description of the existing sea defences and drainage pattern, the maintenance of which—excluding the farm ditches—is now being supervised by a Resident Engineer and financed by the State. Before the reclamation work was commenced in 1942, much of the land was derelict because of its low-lying nature and flooding by tidal waters from the rivers—due to faulty embankments. Ditches and sluices were unable to cope with this water at high tides. Some of the farm-houses were isolated at times with water in their ground floor rooms, and the road from Tre'rddol to Ynyslas and Borth was frequently impassable. The improvement in the land resulting from the reclamation is obvious to all and there is little doubt that the community in general has also derived considerable benefits from the scheme. The main problem for us to consider is how the sea defences and drainage system are to be maintained, and by whom.

26. Maintenance work on the sea defences falls into two categories.

Firstly, the embankments must be kept up to the required height. The embankments lose height in consequence of the compression of the peat foundations by the weight of the embankments themselves, and also as the result of the settlement of the materials from which they are constructed. There is little doubt that the use of peat for the construction of the embankments is far from ideal, but it is the only material readily available locally.

Secondly, all damage must be repaired as soon as it occurs and the turf covering kept in good condition. The need for immediate action was emphasized this year when part of the Cletwr embankment collapsed following a high tide. The breach might have had very serious consequences had there not been a staff available to repair the gap before the next high tide.

27. The maintenance of the drainage system presents an economic rather than a technical problem. Under the reclamation scheme all drainage channels were improved, and—at the time of our inspection—appeared to be of satisfactory depth and width. Many of the channels, however, that would normally be regarded as farm ditches have become so wide and deep that they are now outside the sphere of normal farm maintenance, and will in future have to be cleansed by machinery. Indeed, some of the drainage channels have no solid bottom, which is an additional reason for cleansing by mechanical means. There also appears to be some confusion as to the ownership and responsibility for the upkeep of the ditches; this would cause difficulties if the responsibility were to revert to the occupiers.

28. Responsibility for the maintenance of the tidal embankments and the drainage system—with the exception of the farm ditches—was with the Drainage Board, but as indicated in the terms of reference the Borth Drainage Board, feeling that the cost of maintaining the work would be beyond any resources they could command, declined to function. We have

endeavoured to ascertain the cost of maintaining the drainage system, bearing in mind the need to make good the gradual settlement of the tidal embankments. According to our information, normal maintenance cost will amount to at least £4,250 annually or 37s. per acre, of which £1,200 or 10s. per acre can be attributed to the upkeep of farm ditches.

29. We cannot overstress the importance of the proper maintenance of the sea defences and the drainage system as a whole if Borth Bog is to remain permanently in agricultural use. In our view the cost of maintenance of the sea defences and main drains is likely to be higher than a Drainage Board can meet from drainage rates, and—apart from the cost—there are serious technical difficulties in the way of the maintenance of the farmers' ditches by the occupiers.

There is, however, a new factor in the situation, namely the establishment for the area of the North West Wales River Board under the River Boards Act, 1948, which will have larger resources at its disposal than a local drainage authority. The River Board will be responsible for such of the drainage system as is designated main river, and we understand that it is likely that the Board will also be responsible for the maintenance of the sea defences. This should be a big step forward in maintaining a proper drainage system in Borth Bog—but part at least of the cost of the work undertaken by the River Board will have to be met by a drainage rate and there would still be subsidiary drains and farmers' ditches to be properly maintained.

We feel strongly that this position will not be satisfactory unless the area is under the control of one authority. There are obvious advantages in this control being exercised by an authority owning the land; for we suggest the authority could—in a case such as this—shoulder responsibility for both the occupiers' and owners' drainage rate, and at the same time undertake responsibility for the maintenance of the subsidiary drains and farmers' ditches. So that the occupier could be given a fair opportunity, we suggest that all he should be asked to pay would be the full fair rent that could be expected having regard to the quality of the land, and taking into account the fact that he would be relieved of all his drainage obligations. We realize that this would mean that the authority owning the land would receive only part of the annual expenditure on drainage work, but it would make certain that the necessary work would be done. We feel that the proper maintenance of the sea defences and drainage system—together with the improvements which we suggest below—will lead to an increase in the agricultural value of the land, and in due course justify increased rentals.

(ii) LAYOUT AND SIZE OF HOLDINGS

30. The tables given in the Appendix (p. 15) show the size-groups of existing agricultural units. It is perhaps unnecessary to stress the importance of the size and layout of holdings in determining the full and efficient use of any land for agriculture. Many of the existing units on Borth Bog are too small and inconvenient for efficient production on the ley system which we recommend, and as a matter of policy some amalgamation and farm boundary adjustments will be essential.

The problem on Borth Bog is that of ensuring, as far as possible, that all the land in the reference area is fully productive. If the land was all of alluvial character, there would be no serious difficulty in dividing the area into holdings of the traditional Cardiganshire family-farm type. In order, however, to obtain full production, it is essential that some of the better alluvial soils as well as some of the less amenable peat soils are farmed together—thus enabling the occupier to maintain a fair head of

dairy cattle on the alluvium; grow arable crops on the alluvium-with-peat; and carry sheep or other stock on the re-seeded peat. Economically this would, in our opinion, be the best way to farm the land of varying types found on Borth Bog. To carry this suggestion into effect would inevitably mean the re-adjustment of existing farm boundaries and would result in some of the holdings becoming larger units than they are at present.

31. The figures in the Appendix indicate that there is marked interdependence between the farming inside and outside the reference area; the boundary of the reference area being a hypothetical line used in connection with the assessment of drainage liability, and it often so happens that the farm homestead is just outside the reference area. We have given this matter much thought in view of the Minister's powers under Sub-section (7) of Section 84 of the Agriculture Act, 1947. In our view it is clearly in the interest of good estate management and good husbandry that—where a substantial part of the farm is within the reference area or where its economy is dependent on the Bog land—the whole of the farm should be in one ownership. The two islands within the reference area, for example, are integral parts of the agricultural economy of the area, and there are other adjoining properties which are essentially bog-land farms. We have therefore delineated on the map the areas of adjoining land which we feel must be regarded as necessary to the full and efficient production of the reference area.

(iii) FIXED EQUIPMENT

32. *Farm Buildings.* Where the land in Borth Bog is let as by-takes there is little or no fixed equipment, and—in the case of most of the smallholdings—fixed equipment is sparse and comprises many sub-standard buildings of wood and corrugated iron. Existing houses and buildings, generally speaking, are poor, usually in a bad state of repair and even where the structure may be reasonably sound, interior fittings and divisions leave much to be desired. Cowsheds that have in the past been used in conjunction with stock rearing are far below the standard expected today for milk production and there is an almost complete absence of facilities for the preparation and storage of feedingstuffs and for the storage of fertilizers. There is little provision for the accommodation of implements or a workshop so essential on a modern farm. Many of the farms are lacking in loose-box accommodation of the right type. Even where the houses are reasonably good, there is generally no bathroom, hot water, or modern sanitary fittings. Obviously there will have to be considerable expenditure on fixed equipment. It is difficult at this stage to give a reliable indication of such expenditure but it is unlikely to be less than £25,000.

33. *Water Supply.* The absence of an adequate water supply at the homesteads and on the land is a serious drawback to full and efficient production. Most of the holdings are dependent upon rain- or well-water for domestic supplies, and upon ponds and ditches for watering their stock. A few farms have a piped supply from a local source but at the time of our inspection only one farm was connected to the main. Water supply should present no serious problem as the Aberystwyth Rural District Council have schemes, either approved or under consideration, to extend their mains within easy reach of homesteads. This matter has assumed added importance now that Cardiganshire has been scheduled as part of a free testing area under The Tuberculosis (Attested Herds) Scheme, 1950, and will be declared an Eradication Area on October 1, 1952, and in view of our recommendation for extension of dairying. It is difficult at this stage to give an indication of the ultimate cost, but we estimate that £4,000 is required to bring piped supply to the homesteads.

34. *Roads.* The area of reference can be said to be adequately served by roads, with the exception of the land around Hen-Hafod and Tan-y-lan, where access is difficult and where some form of farm road is necessary if the land is to be farmed on the ley system. We accordingly recommend the construction of 2,600 yards of farm road at Tan-y-lan, from homestead to cattle sheds at lower end of the farm, and at Hen-Hafod, from homestead to the railway, as indicated on the Map which accompanies this report. The cost is estimated at £3,000.

35. *Other Fixed Equipment.* There is an obvious need for extensive under-drainage throughout the area. Some of the Bog has in fact already been tile-drained but most of these drains have now become ineffective. The pipes used appear to have been of very small diameter and many of the old outlets have inadvertently been damaged during the course of the drainage scheme. We do not anticipate any difficulty in providing adequate drainage outlets with the existing water-level—and we appreciate, of course, that on the peat tile-drains would be unsuitable, and other methods of under-drainage, such as bush, sod or stones, would have to be used. The fencing of ditches to prevent damage by, and to, stock is essential.

SECTION VII. CONCLUSION

(i) RECOMMENDATIONS

36. Our principal recommendations for the full and efficient use of Borth Bog for agriculture are as follows:—

- (a) That ley farming with a high proportion of grass and with the emphasis on milk and fat lamb production is, generally speaking, the appropriate system for the area. (Paragraph 22.)
- (b) That the tidal embankments and the drainage system must at all times be maintained in good and efficient condition under unified control. (Paragraph 29.)
- (c) That some amalgamation of existing agricultural units and the adjustment of boundaries will be required over a period of years to make sound economic holdings, containing as far as possible a proportion of alluvial as well as of peat soils. (Paragraph 30.)
- (d) That where necessary suitable homesteads be rehabilitated and adequately equipped. (Paragraph 32.)

(ii) COMPULSORY PURCHASE OR HIRING UNDER SECTION 84 OF THE AGRICULTURE ACT, 1947

37. We have to consider whether the recommendations put forward—for work to be undertaken, or fixed equipment to be provided or maintained—can be put into effect without the exercise of the Minister's power of compulsory acquisition under Section 84 of the Agriculture Act.

Our fundamental recommendation is the adequate maintenance and control of the sea defences and the drainage system, in order to ensure that at all times they are in good condition, and in Paragraph 28 we have estimated that this will cost 37s. an acre, of which not less than 10s. an acre would be the liability of the occupiers in respect of the maintenance of farm ditches. Part of this work will be the responsibility of the recently constituted North West Wales River Board, but they will presumably require a contribution towards the cost of it from an Internal Drainage Board, which would be responsible for such of the drainage, excepting farm ditches, as the River Board did not undertake. We do not consider that the Drainage Board could in the ordinary way command sufficient resources to pay the necessary contribution to the River Board and at the same time finance the maintenance

of the subsidiary drains. So far as the enlarged farm ditches are concerned, it will in our view be impracticable for technical as well as for financial reasons for the occupiers to keep them in good order. We feel that the only way of ensuring the adequate drainage of Borth Bog is for one authority to be responsible for co-ordinating all drainage activities, including the farmers' ditches, and to make such contribution as may be necessary to the River Board. As we have already stated, there would be an obvious advantage in the controlling authority owning the land as it would then be possible to recover at least some of the expenditure on drainage by increased rents.

38. We also recommend some amalgamation of units and the adjustment of farm boundaries, and these can only be effected satisfactorily if the area is in one ownership. Furthermore, the cost of the repairs and improvements to fixed equipment which we consider necessary to ensure full production, might well amount to £32,000, and would be such that it would be unreasonable—in our view—to expect the existing owners and occupiers of the land in the area to undertake.

39. We consider that the recommendations we have put forward for the full and efficient agricultural use of the land cannot reasonably be expected to be put into effect by the existing owners and occupiers, and that there is a case in the national interest for the Minister to exercise his powers of compulsory purchase or hiring under Sub-section (1) of Section 84 of the Agriculture Act, 1947, in respect of the area under reference.

40. We desire to suggest that if the Minister of Agriculture accepts the recommendations in this report and acquires the area of Borth Bog referred to us, he should consider exercising his powers of compulsory purchase or hiring under Sub-section (7) of Section 84 to acquire the 300 acres of adjoining land, indicated on the accompanying Map, as in our view its acquisition would be necessary to ensure the full agricultural use and efficient management of the Bog and in order to carry out the adjustments we have suggested.

41. In conclusion, we wish to make it clear that we fully appreciate that the cost of giving effect to the recommendations made in this Report will be high. Nevertheless, it is essential that the work we propose should be carried out and the fixed equipment provided if this area of Borth Bog is to be fully and efficiently used for agriculture. Whether the cost would be justified from the wider point of view of national economics is a matter on which we are not in a position to give a considered opinion.

We have the honour to be,

Sir,

Your obedient Servants,

(Signed) C. BRYNER JONES,
Chairman

J. C. WYNNE FINCH

D. MORGAN REES

R. W. WOOSNAM

December 21, 1950

W. WILLIAMS, Secretary

Welsh Agricultural Land Sub-Commission,

Victoria House,

Marine Terrace,

Aberystwyth.

APPENDIX

THE STRUCTURE OF FARM UNITS ON BORTH BOG

(Vide Paragraphs 9, 30, 31)

A. Classification of Units according to Acreage

| | Number of Units | Acreage | Per cent |
|-------------------------------------|--------------------|-----------|----------|
| 1. Under 20 acres | 23 | 210·788 | 7 |
| 2. Between 20 and 50 acres | 10 | 325·185 | 10 |
| 3. Between 50 and 100 acres | 7 | 490·436 | 15 |
| 4. Between 100 and 200 acres | 4 | 522·282 | 16 |
| 5. Over 200 acres | 5 | 1,641·780 | 52 |
| | | 3,190·471 | 100 |

B. Classification of Units according to Unit Type

| | Number of Units | Acreage | Per cent |
|---|--------------------|-----------|----------|
| 1. Self-contained units entirely on the Bog ... | 8 | 638·012 | 20 |
| 2. Self-contained units partly on the Bog ... | 12 | 1,738·640 | 54 |
| 3. By-takes | 5 | 433·750 | 15 |
| 4. Accommodation land | 20 | 239·891 | 7 |
| 5. Units of common land | 3 | 116·224 | 3 |
| 6. Woodland units | 1 | 23·954 | 1 |
| | | 3,190·471 | 100 |

C. Classification of Units according to Economic Efficiency

| | Number of Units | Acreage | Per cent |
|---|--------------------|-----------|----------|
| 1. Self-contained economic units entirely on the Bog | 7 | 789·403 | 25 |
| 2. Self-contained <i>uneconomic</i> units entirely on the Bog | 4 | 160·994 | 5 |
| 3. Self-contained economic units essentially Bog Farms although part of the holding is off the Bog and very frequently this holding contains the homestead | 4 | 830·233 | 26 |
| 4. Self-contained <i>uneconomic</i> units as 3 above | 6 | 149·964 | 5 |
| 5. Self-contained economic units which are essentially upland farms although part of the farm is on the Bog | 1 | 501·000 | 16 |
| 6. Self-contained <i>uneconomic</i> units as 5 above | — | — | — |
| 7. Self-contained economic units partly on the Bog and partly upland which cannot be classified as either definitely upland or definitely Bog land farms | 2 | 367·926 | 11 |
| 8. Self-contained <i>uneconomic</i> units as 7 above | — | — | — |
| 9. Other <i>uneconomic</i> units not self-contained | 25 | 390·951 | 12 |
| | | 3,190·471 | 100 |

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