

## Hill Land Utilisation in Ulster

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This paper examines the use of hill land in Ulster at the present time, with particular emphasis on the improvements being undertaken to reduce the gap between present and potential productivity and with consideration of some of the problems arising out of fuller utilisation

Of the total land area of Northern Ireland about two-thirds is returned in the Agricultural Statistics as under crops and pasture<sup>1</sup> The remainder includes urban areas and lowland bogs, but by far the greatest part is hill land Some land which can properly be termed hill or mountain land is cultivated, but, relatively, it is only a small amount, the margin of cultivation being generally between 500 feet and 700 feet For the purposes of this paper, hill land may be taken as any land over 700 feet or any land of lower elevation which is unsuited for cultivation by normal modern methods either because of its topography, e.g., steepness of slopes or rock outcrops, or a combination of other factors among which altitude, or climatic disabilities produced by altitude, play a significant role As land of this type amounts to about a quarter of the whole of the Six Counties its actual use and potential value are of considerable significance in any drive for maximum production, productivity and employment In the northern part, north of Belfast, Lough Neagh and Omagh, the proportion of hill land is much higher, since the whole of the basalt plateaus and the Sperrin Mountains are included (Fig 1) It is with these major hill areas of the north that this paper is primarily concerned, though much of the material relates to the whole of the hill country of Northern Ireland The Mourne are the only Ulster mountains for which a comprehensive study<sup>2</sup> exists but this permits the omission here of much historical and environmental detail For certain information of a technical character it is advantageous to refer to experience gained in Scotland It is particularly instructive to refer to Kintyre which, geologically, topographically and climatically is similar to Ulster and, with only twelve miles of water between Fair Head and the Mull of Kintyre, has been intimately linked with it in history, yet has had a different form of land tenure and different experiences in land use planning

<sup>1</sup> Land area 3,351,444 acres (about 5,236 square miles) Crops and pasture (1st June, 1953), 2,277,894 acres

<sup>2</sup> Evans, E E *Mourne Country Landscape and Life in South Down* (Dundalk, 1951)



FIG 1 The major hill masses of the province, illustrating the considerable extent of high land in the northern part, and the relationship of the Ulster and Kintyre hills

Mountain land in the British Isles may be valuable for any one or more of the following enterprises

Agriculture, primarily stock rearing with limited cropping for supplementary feeding of stock

Afforestation

Generation of hydro-electric power

Water supply for urban areas or industrial use

Mineral extraction

Peat cutting for fuel

The hills may also provide much needed escape for city dwellers, though this amenity value can only be expressed in economic terms in so far as it facilitates development of a tourist industry. Letting of the land for the value of the game may be regarded as akin to this class of use, but is commonly in conflict with it.

As this selection is the product of physical, historical and economic conditions, these forces have to be examined if the present distribution of utilisation in any one group of hills is to be understood.

The hills of North Tyrone, Derry and Antrim, fall into two main groups in physical characteristics

- (a) The dissected plateau of basaltic rock, comprising the hills of Antrim, and the northern hills of Derry from Binevenagh to Mullaghmore (Plates 1, 3 and 5)
- (b) The Sperrin Mountains and related groups (Plates 2 and 4)  
These are sculptured from the much older Dalradian rocks, mainly schists, which reappear in north-east Antrim where the basaltic cover has been removed by erosion, and again in Kintyre, being thence continuous across Scotland to Aberdeen.

The basalt plateaus provide considerable areas over 1,000 feet with numerous tops rising to about 1,500 feet, but nowhere reaching 2,000 feet. Slopes are gentle, except where the recession of the escarpment, partly by a process of landslip and rock-fall, has produced striking but friable cliffs, as on Binevenagh, Cave Hill, and along the present sea coast. The talus slopes below these cliffs, and the terraces and intermediate levels being of basic rock may develop a good sward which if properly managed can provide excellent grazing (Plate 1). The basic qualities of the more gentle slopes are all too often neutralised by the deep accumulation of acid peat which overlies large areas, but where drainage is adequate arable land may be found at 1,000 feet in favourable situations (Plate 5).

The Sperrin Mountains rise higher, with several tops over 2,000 feet. Incipient corrie formation results in steep slopes in the central mass, but in general, slopes are not markedly steeper than those of the basalt hills, and peat has accumulated in similar quantities in blanket and basin bog form. Over considerable areas glacial and glaciéfluvial clays, gravels and sands mask the solid geology and frequently underlie the peat. Adequate mapping of the drift has never been undertaken and such geological maps as exist date from 1890-1900, though remapping is progressing slowly.

Soils, the product of the underlying rock or drift and of the changing climates of post-glacial times, are mainly peaty or skeletal. They lack plant foods both because of the initial poverty of the parent material and the severe leaching occasioned by high precipitation and low evaporation. Only in small areas have the soils been mapped.

The lack of climatic details, especially of temperature, constitutes a further hindrance to land use research on the area.<sup>3</sup> For the moment

<sup>3</sup> The Department of Geography, Queen's University, has now (April, 1956) established the first high level climatological station in Ulster. It is situated on the slopes of Divis at about 1,200 feet. Cattle and sheep are grazed on the surrounding hill pastures which include montane grasslands and heather moor. It is hoped that other stations will be established in the near future.

we may simply note that the average annual rainfall of none of the hill groups in the Six Counties is particularly high, the maximum being about 60 inches in the Sperrins, with 50 inches much more general, compared with well over 100 inches in many parts of Great Britain. Mean figures, however, do not reveal the serious deviations which make agriculture much more difficult than these figures suggest. Though gales are not nearly so severe or frequent as in Donegal on the one hand or Kintyre on the other, frequent strong winds endanger forests, and the lack of shelter from wind and driving rain reduces the value for stock of the generally mild conditions, whilst, during periods of snow, drifting is more to be feared than depth of fall. Foresters are most concerned with the problems of wind though frost is locally troublesome (Plate 4).

The climatic climax vegetation in these physical conditions would probably be oak-birch-heath, or alder and thorn scrub except on exposed summits and ridges, but long continued grazing and human interference has produced a biotic climax almost everywhere. Heath or moss types on acid peat share the slopes of the hills with montane grasslands. Except where naturally well-drained as on the basalt scarps, or where artificial drains are kept open, the better grasses such as *Fescues* and *Agrostis* become replaced by *Molinia*, *Scirpus*, *Eriophorum* and *Sphagnum* associations. Overgrazing hastens the process, and facilitates invasion of the drier parts by *Nardus* and other coarse vegetation. At the other extreme, lack of grazing or poorly balanced pasturing facilitates the spread of bracken and whins. There is ample evidence of extensive forest cover in past ages but woodland is to-day extremely scarce, being almost limited to the new plantations of the Ministry of Agriculture. The assistance given by felling and burning to the climatic tendency to replacement of forest by bog has in Scotland received much attention from botanists and geographers and there is a general appreciation of the efforts made since the eighteenth century to reverse the process by establishment of woodlands. In Ireland the deterioration was equally severe but remedial measures are only now beginning to be significant.

Before turning to the principal uses of the hills of Northern Ireland for farms, forests, and water gathering grounds, the lesser uses may be dealt with summarily.

The extraction of minerals does not directly affect the other possible uses of the Ulster hills to any material extent, since the availability of rocks of economic importance is very limited. These are virtually confined to granite, roadstone and superficial deposits of sand and gravel, apart from the chalk which appears extensively in the coastal cliffs only. Quarrying roadstone, sand and gravel is economically more attractive in lowland deposits nearer the principal areas of demand. The sands and gravels, which until recent years were worked for local needs only, are now being exploited commercially in some areas, but this again is not a matter of much importance for the subject of this paper. Although prominent in some areas, principally the Sperrins, the deposits occur mainly at levels lower than 700 feet. Apart from the supply of aggregate they are important in providing well-drained and easily worked soils which are suitable for arable cultivation at an elevation normally marginal for crop production. Extraction of gravel has not so far made significant

inroads into this arable land, and it would not appear likely to do so for a considerable time to come, though as quarries are extended they may seriously threaten the working of individual farms

The peat bogs continue to yield the bulk of the fuel used in the rural cottages and the possibility of using peat for production of electric power in Northern Ireland, as in Éire, has received attention. A survey of deposits has been completed by the Ministry of Commerce, but it would seem that resources are inadequate for electricity generation<sup>4</sup>. There is scope for more study of the use and potential agricultural value of the rapidly increasing acreage of cutover bog.

The tourist industry has not been intensively developed though some attention has been paid to it in the Mourne, and irrespective of planned attraction of visitors, the open hills attract considerable numbers of people. No land is given up completely to this use, however, nor are there sufficient numbers of people walking the hills to interfere with or compete with any other use. Sporting rights are still exercised in some areas but do not appear to be important in the economy.

To turn to the major classes of land utilisation in the Ulster hills, agriculture is the traditional form, with reafforestation, the chief challenger, continuously taking in more land and for this reason alone being viewed with considerable suspicion, and in some cases openly opposed, though offering a valuable alternative form of employment.

The state of hill farming in Ulster as elsewhere in the British Isles is undoubtedly more promising than it has been for some decades, and it is encouraging that the main topics to-day are improvement and the power of the industry to resist competition for its land. For long periods prior to the second world war sheep farming was in such a low state that any other use of the land seemed to offer greater rewards and survival rather than improvement preoccupied the hill farmer. Early wartime conditions did not, at first, help him as they did his lowland counterpart. The accent was on cropping and the financial inducements went to the farms which were already largely arable or capable of conversion to intensive cropping, whilst the traditional markets of the hill farmer were narrowed by the reduction in the number of livestock carried in the lowlands. The hill sheep subsidy introduced in 1941 facilitated recovery so that production on hill land to some extent offset the loss of mutton and wool occasioned by the lower and more fertile land being turned over to other forms of production. The scheme remains in being but subsidies have not been paid since 1952 due to the satisfactory level of prices, though a special payment was authorised for 1955, on account of the losses due to the exceptionally severe winter.

Subsidies and prices both have thus encouraged a fuller stocking of the hills with sheep, and there is little doubt that a more satisfactory proportion of the total sheep stocks of Northern Ireland, which in 1953 were higher than ever before, is to be found on the hills throughout the year (Fig. 2). Quality is, however, at least as important as quantity and it is a prime concern of the men who

<sup>4</sup> Council of Scientific Research and Development. *The Northern Ireland Peat Bog Survey. The Final Report of the Preliminary Survey* (Belfast, H.M.S.O., 1956).

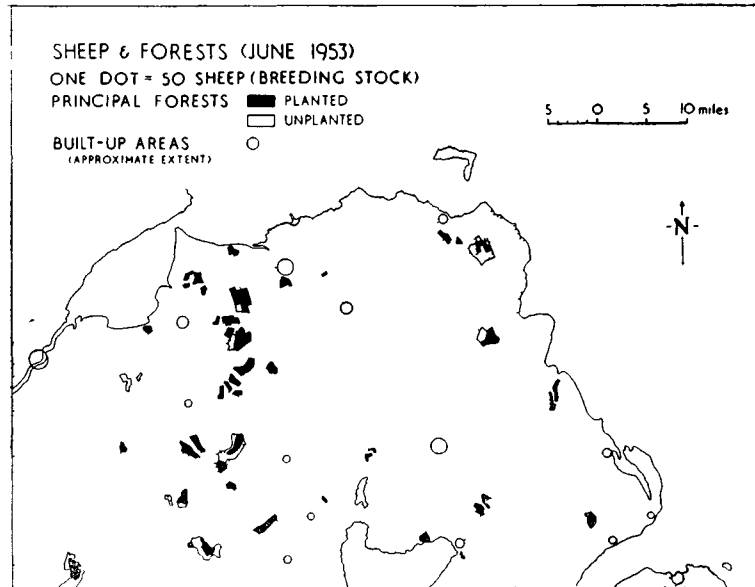


FIG. 2 This distribution map, constructed from detailed information supplied by the Ministry of Agriculture for Northern Ireland, shows the concentration of sheep rearing on the hills and the competition from forestry

breed the best foundation flocks that their stock shall maintain and improve upon the recognised characteristics of the breeds, and this is one of the principles which can do no harm by being more widely understood and upheld. The principal breed on the Ulster hills, as in Kintyre and over most of the Scottish hill country, is the Mountain Blackface, about 70 per cent of all the sheep of the Six Counties being of this breed or crosses in which the strain predominates<sup>5</sup>. It is a well tried breed, noted for its hardiness, and undoubtedly it is the right type for most of the Ulster hills. The breed in Northern Ireland has been greatly improved in recent years by a comparatively small number of men who have concentrated upon it, their work being facilitated by the premium schemes for Blackface rams operated by the Ministry of Agriculture. The introduction of rams of known breeding from Scotland has been accompanied by the building up of pedigrees at home, and there is now a reasonable number of first class flocks in the Six Counties, mainly in Antrim, Derry, Tyrone and Down. The productivity of marginal uplands is increased by the practice of crossing Blackface and Border Leicester strains. The Cheviot breed which would be suitable for much of the country is not much favoured, and there may be a case for its extension, though differences of prices hardly encourage experiment.

The quality of the mountain sheep is not only a matter of breed and pedigree but of the management of the flock throughout its

<sup>5</sup> Cmd 87 Government of Northern Ireland *The Agricultural Output of Northern Ireland, 1925* (Belfast, 1928), p. 35

history, and with that is coupled the care of the hill which is the home of the flock. Careful management of the hill implies stocking at the optimum level. Encouragement of the best practices is made difficult in Ulster by the large number of small farmers involved. Some of the hills are probably understocked, many are undoubtedly overstocked. But also leading to the deterioration of the pasture is the lack of balance between numbers of sheep and cattle grazed on the hill. The traditional form of land utilisation in Ireland centred on cattle but since the spread of sheep farming in the 19th century hill grazings have been little used for cattle and they have come to be regarded widely in Ulster as fit for sheep only. The grazing of cattle is, however, necessary to the maintenance in good condition of the hill grazings to offset the selective habits of the sheep, and a well managed hill can produce both better sheep and some store cattle as well, so yielding a higher total return, where the grazing of both kinds of stock is carefully arranged. It is, therefore, encouraging to see more cattle on the hills in recent years, especially on the larger holdings, but there are still many districts in Northern Ireland where the advantages of mixed grazing are not appreciated.

Until 1943 there was little recognition from the Government of the opportunities that were being wasted. The Livestock Subsidy of 1934 was for fat cattle and so, although it stimulated the finishing of stores in the Ulster lowlands, it carried no benefit to the rearer on hill or marginal land. Relatively, his position was worsened, and this disability was accentuated by the emphasis on milk during and immediately after the war. Wartime shortages, however, led to a subsidy being offered for hill cattle in 1943, since when the rate of subsidy has varied between £2 and £2 17s 6d per head with a higher rate in some years for cows suckling calves on the hill. In Northern Ireland claims on which this subsidy was paid reached a peak in 1946, the number of cattle concerned being just over 56,000 or about one-tenth of the cattle, other than dairy cattle, returned in that year's census. This was the year in which the Agricultural Inquiry Committee prepared their report<sup>6</sup> but scant attention was paid in it to the achievements or needs of hill farming. United Kingdom policy led, however, to the extension to Northern Ireland of a more progressive subsidy scheme in 1953. Whereas under the earlier scheme, which ceases to function after 1956, there is a temptation to put cattle on the hill for the minimum qualifying period of 16 weeks with an eye to the subsidy rather than as a deliberate act of hill farming, the new scheme represents a move to give recognition to the *bona fide* breeder, subsidies being authorised at a special rate for cows and in-calf heifers forming part of a regular breeding herd.<sup>7</sup> The cattle must be maintained throughout the year on hill land or land used with it. Cows kept wholly, or mainly, for dairying purposes are not eligible, the scheme being essentially for cows maintained throughout their normal breeding life for the production of cattle for sale as stores. The amount per cow paid in 1953 and again in 1954 was £10, and the number of cows for which payment was

<sup>6</sup> Cmd 249 Government of Northern Ireland *Reports of the Agricultural Inquiry Committee* (Belfast, 1947)

<sup>7</sup> The Hill Cattle (Breeding Herds) (NI) Scheme, 1953

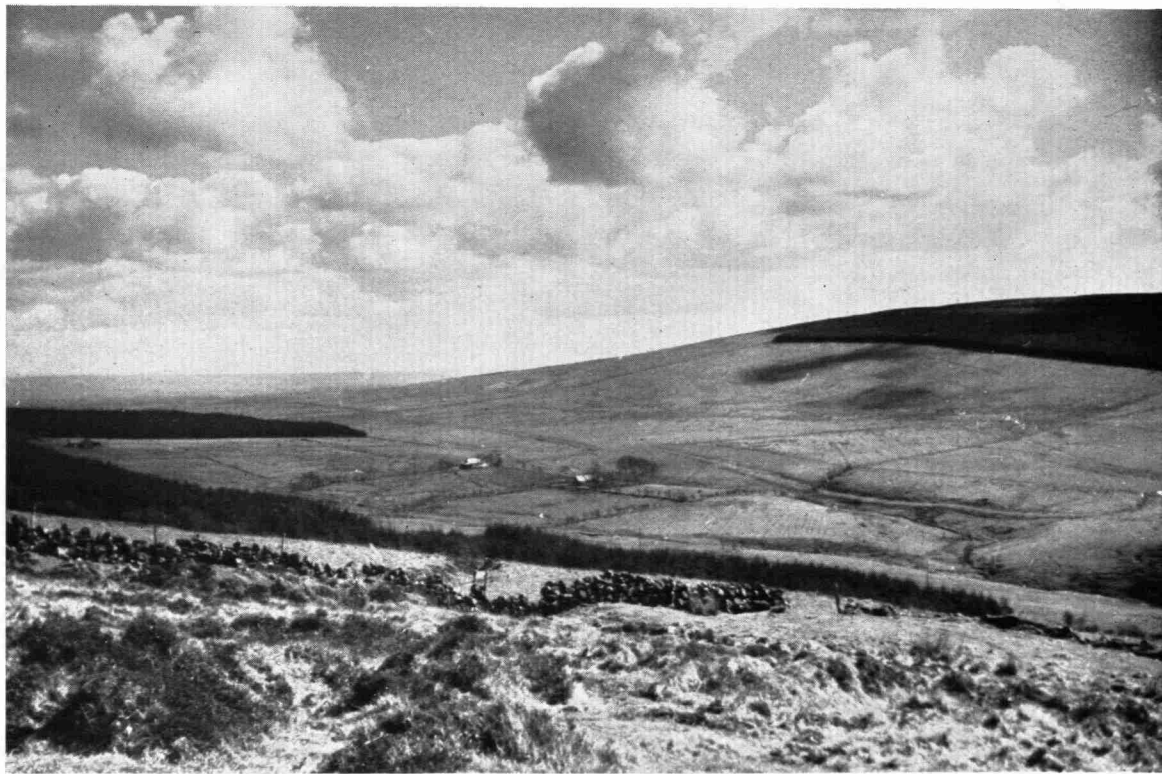


PLATE 3. *Hill grazings in the North Derry hills flanked by parts of Cam Forest, established about twenty years ago. In the foreground is degenerate in-bye at about 800 feet, comprising heather and rough grass.*





PLATE 2. *Glenelly, in the Sperrins. A holding extending from the glacial gravels which show severe local erosion to the peat-covered schistose slopes, recently acquired for afforestation and now being planted. The abandoned cottage in the foreground is a common sight in the glen, which is suffering rapid depopulation. A good road serves the valley, but there is no public transport.*

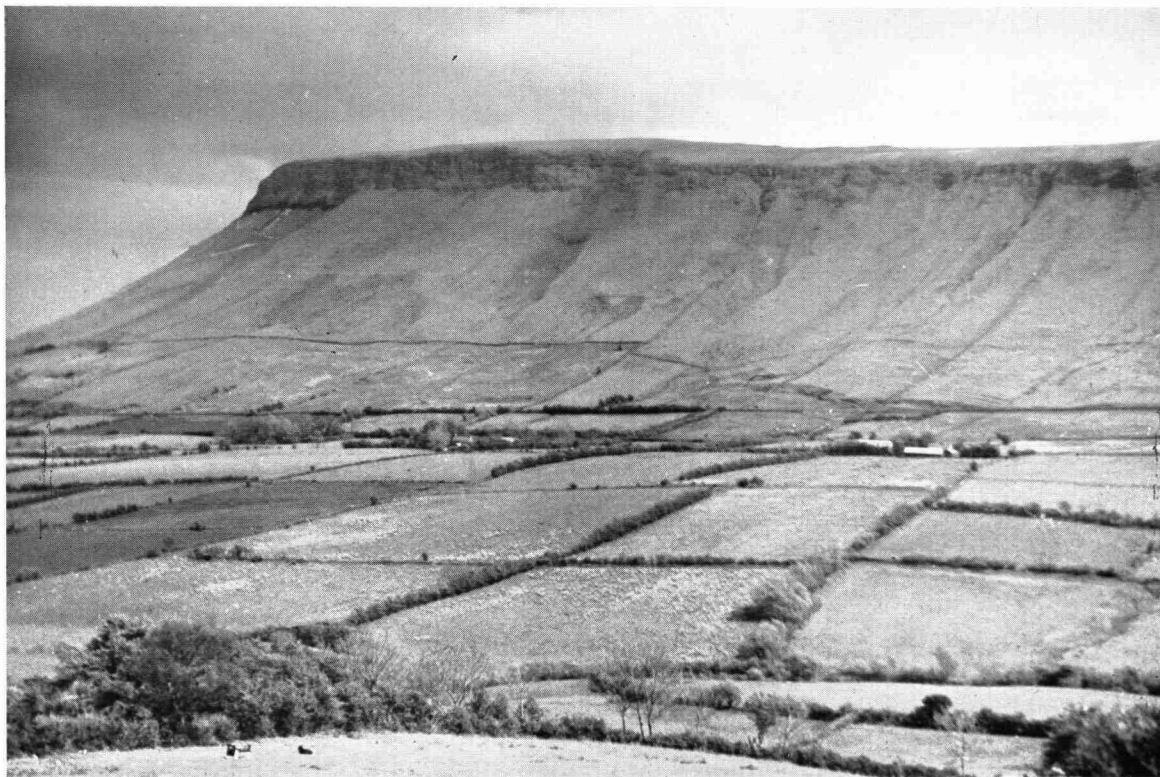


PLATE 1. *The basalt escarpment in North Antrim (Glen Emon). Cultivation ceases between 400 and 500 feet, above which are three joint holdings in which eight owners have shares. The basalt and underlying chalk provide good fescue-agrostis pastures which are being invaded by bracken. Above the cliffs (900-1,000 feet) drainage is poorer and coarser vegetation is developed on peat.*

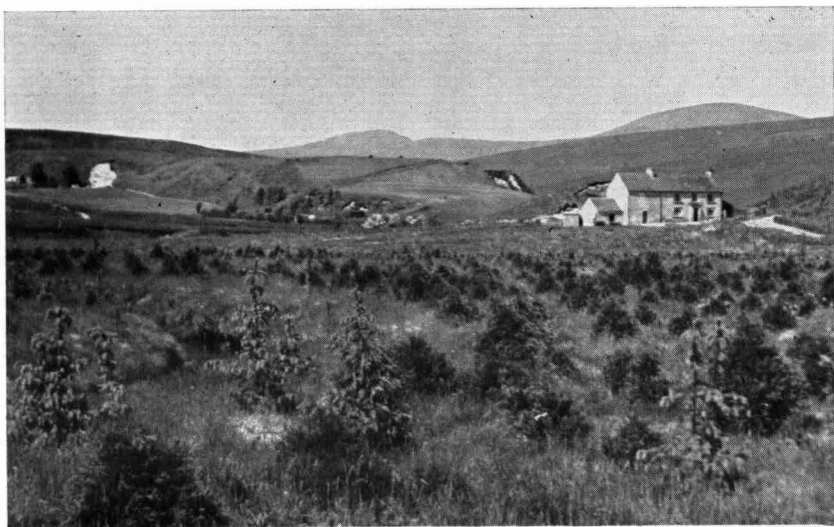


PLATE 4. *A young plantation in the upper Glenelly. On the steeper slopes growth is satisfactory, but Sitka Spruce in the hollow show frost damage to a height of about 2 ft. 6 in—to the tip in the case of the plant on the extreme left. The gravel mounds provide well-drained fields for adjacent farms but obstruct down-valley air drainage.*



PLATE 5. *Good arable land at 1,000 feet on the south-facing flank of Slemish, a volcanic neck, contrasts with the rushy grassland on the ill-drained surface of the basalt plateau.*

approved was just over 11,000 in 1953 and 16,000 in 1954. Pasturing must be conducted "in such a manner as to bring about the maximum benefit to the grazings" and as in the earlier scheme the farmer may be required to devote a proportion of the subsidy to specific improvements in the land.

This scheme may lead in time to more widespread acceptance of hill cattle rearing as a specialised enterprise, hitherto almost confined to parts of the Antrim hills, where Galloway herds reflect the influence of a geographical proximity to the home of the breed. No encouragement was given to the rearing of Galloways by the Agricultural Inquiry Committee which, reporting in 1947, did not appreciate the rapidly approaching saturation of the milk market and the corresponding failure of the supply of beef cattle to equal the demand. Indeed the report states "The ultimate object to be aimed at is that all premium bulls should be of the Dairy Shorthorn (pedigree or non-pedigree) type with good milk yields"<sup>8</sup> In Northern Ireland generally there remains little official encouragement to the enterprising hill farmer who seeks to rear Galloways as a means of obtaining from the hills a reliable contribution to the supply of home-grown beef, but fortunately there is a nucleus of premium Galloway bulls in the Glens of Antrim to day as there has been for over fifty years.

For the improvement of holdings additional government help is available in the form of grants towards the cost of specific jobs. The work most necessary for the improvement of hill land is generally the renovation of old drains and cutting of new ones. This is work which has been seriously neglected in past decades so that something more than the normal attention, which should be given to all drains in rotation, is needed to bring back the land to full productivity. Good drainage can make a tremendous difference to the amount and quality of keep on a hill.

The second most general need is for more and better fencing. This, like drainage, is an expensive business which tends to be neglected when times are bad. The making of a fence which will be both sheep and cattle proof is an art in itself. There are some good fences to be seen now on Ulster hills though there are also some very poor ones, and many hills have no effective fencing at all above the limit of present cultivation. Where hill farming is on a more extensive basis, as over much of Scotland including Kintyre, the provision of full march fences would be quite uneconomic. Provided all adjacent hills are stocked, hirsels will keep to their own ground and only lambing parks, etc., need be fenced. In Ulster this is rarely the case as areas are small and poaching occurs readily in consequence.

Similarly, the condition of the houses and buildings is a matter which concerns the hill farmer as much as his lowland counterpart. Few of the upland farms have good houses or buildings, and the general level is undoubtedly inferior to that in Britain. With the relatively slow development of electrification in rural Ulster, the difference is widening, especially in comparison with Scotland, where the work of the North of Scotland Hydro-Electric Board has brought enormous benefits to the farms and crofts. The proportion of hill farms having their own private plants also seems much lower in

<sup>8</sup> Cmd 249, p. 30

Ulster than in Britain. The lack of good houses and domestic amenities is discouraging to the more progressive farmers and their wives, even more than to the less enterprising. In the long run it may be that the grants for reconstructing or building new houses on the marginal and hill farms may be more effective in increasing their productivity than expenditure in other directions.

The character and intensity of land utilisation is also inevitably influenced by accessibility. On the whole, the Ulster uplands are relatively well served with roads. Roadmaking to facilitate turf cutting, water schemes and reafforestation has greatly improved the position in the last few decades and few farms are far removed from a reasonable road. Public transport services are, however, much more restricted and anyone living in the hills is likely to have cause to feel bitter about the inadequacy of bus services. In these last two details, the position in Scotland is the reverse of that in Ulster. In Scotland in general there are fewer roads but most of them have bus services. The telephone service is also quite inadequate in many of the hill districts. The Glenelly (Plates 2 and 4) is an outstanding example of a large valley which suffers from the lack of both bus and telephone services, though it has a good road.

Improvement of hill land for farming purposes is, of course, directed ultimately to the increase or maintenance of output of live-stock, towards the production of the more remunerative types of product, and to the placing of the product on the market at a season when conditions of supply and demand result usually in good prices. The full benefit from the improvement of hill land on the farm can only be achieved if improvement of the lower land, for tillage and higher quality grass is kept in step. Reference must, therefore, be made to the schemes of the Ministry of Agriculture for reclamation of hill land to be used as inbye. Under this scheme the Ministry makes available the services of a skilled team using a special plough and disc harrow capable of dealing with up to 18 inches of peat cover and reclaiming fields which have not been ploughed for half a century if at all. The work is done on the theoretical basis of a 50 per cent grant, the ploughing and harrowing being regarded as the Ministry's contribution, the liming and sowing out to approved standards being the farmer's responsibility. By this scheme, a useful addition has been made to the arable acreage of many hill farms in Counties Derry and Tyrone from land which would be beyond the power of the farmer's ordinary equipment to reclaim.

Many holdings are being improved gradually, with or without aid from the state. But for the farmer who desires and can afford a comprehensive scheme, there is assistance on a really generous scale. Under the Hill Farming Act, 1946, the provisions of which were continued and extended by the Livestock Rearing Act, 1951, hill farms can be assisted at the rate of one-half of the approved cost of schemes considered necessary for rehabilitation or improvement. These may include all the afore-mentioned categories of improvement, together with shelters, shelter belts, pens, dips, silos, liming, manuring, removal of bracken, whins and boulders, laying down to permanent pasture, reseeding and regeneration of grazings, pest destruction and the provision of machinery and implements.

It is its very comprehensiveness which limits the applicability of

the scheme. Conditions are stringent to ensure that public money is not wasted on unsound schemes. Grants are available only if the applicant is prepared to carry out all the improvements considered necessary by the Ministry and this frequently calls for an outlay of capital greater than the farmer is willing or able to meet. The amount of work done under the Act is by no means small, but it is not in Northern Ireland revolutionising the position of hill farming or the state of hill land. It is from County Antrim that there has been the greatest response to the opportunities offered by the scheme. Up to the 31st March, 1955, out of 486 holdings for which schemes had been approved or were under consideration, 349 or 72 per cent. were in Antrim, and of the £282,000 allocated for formally approved schemes £220,000 was for the Antrim schemes, compared with £35,000 for those in Tyrone, £25,000 for those in Derry, and £2,000 for those in Down, whilst no schemes had been promoted in Armagh or Fermanagh. Figures for the schemes still under consideration are in similar ratio, so it is evident that the predominance of Antrim farmers in taking advantage of the scheme continues.

Mention has been made of many obstacles to improved utilisation of hill land, including financial limitations, lack of technical knowledge, unsatisfactory housing and social conditions and to these could be added the whole range of problems which are associated with depopulation and the unsatisfactory age and sex structure of many of the rural communities to-day. These have been widely discussed elsewhere and it is not proposed to deal with them here, but attention will be given to the significance of the type of ownership of the hill lands and the size of farms. The distribution of land in terms of ownership underlies the detailed pattern of land utilisation. Thus, hill land owned by a forestry authority is likely to be planted in all suitable parts, whereas that owned by water supply authorities may be afforested in certain parts only, grazed in others and sterilized in yet other parts, according to the beliefs which have found favour with the authority concerned. The various uses to which land owned by public bodies is put in fact, and to which it might be put, is in itself an important field of study. Private estates in the British Isles are commonly divided between farming and forestry but systematic silviculture seldom survives their break-up and productive forests are usually absent in the landscape of owner-occupied farms. The character of farming usually is influenced by the size of unit and system of tenure as well as physical and market conditions, due to the close connections between scale of operations, capital resources and earning power. The relationships are complex and generalisations dangerous, but in given areas it may be possible to distinguish certain principles. In Northern Ireland about 80 per cent. of the land is farmed by owner-occupiers. Few lowland farmers do not own their land if we extend the term ownership to apply to those who are purchasing but have not yet paid off the annuities of the Land Purchase Acts. The letting of land, as in *conacre*, modifies the position in detail, but not fundamentally. Much of the hill land which is still owned by farming interests is, however, only partially fenced, ownership being of a joint nature and grazing regulated by a system of *soums*. In evaluating the productivity of hill land, and especially the difference between the present and potential productivity, it is necessary to know the

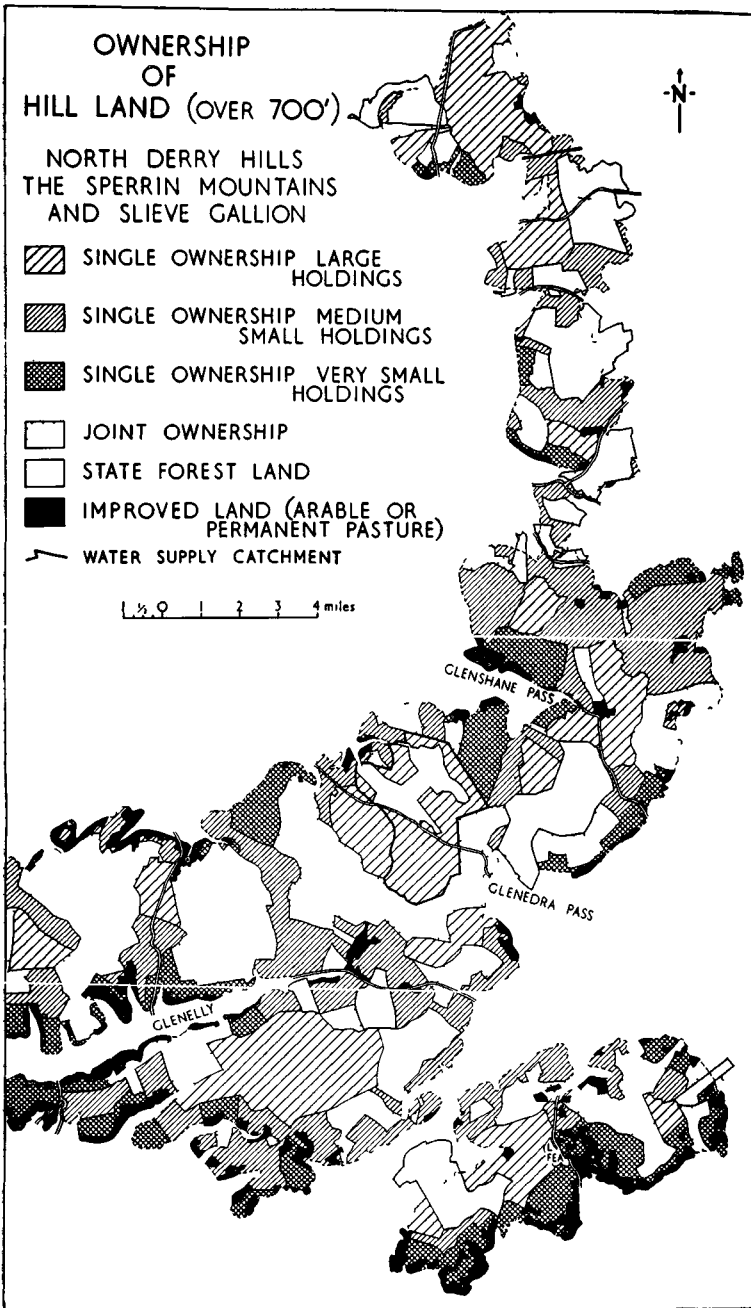


FIG 3 *The classes of ownership in the Sperrin Mountains and neighbouring hills, showing the position in 1955, compiled from official records and field investigation*

proportions of each class of land under each kind of ownership or management

With this need in view maps have been constructed to show the distribution of different classes of holdings on the Ulster hills, and the results for the main mass of the Sperrin Mountains and the basalt hills northward to Binevenagh appear in Fig 3. Only land above the 700 foot contour is shown on the map so that it is almost all uncultivated, solid black being used to denote the extension of arable fields or improved permanent grassland above 700 feet. This representation of the margin of cultivation is based on the maps of the Land Utilisation Survey of Northern Ireland which records the position in 1938-9, but it is substantially the same to-day. Fig 4 shows the holdings on part of the North Derry Hills on a larger scale and includes examples of each of the size groups. Only land which was found in good condition in 1956 is shown as cultivated on this map.

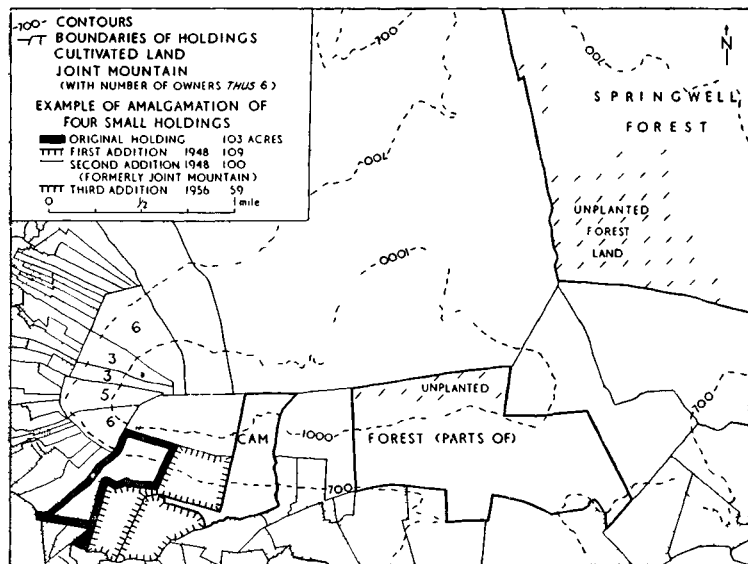


FIG 4 Part of the North Derry hills, showing boundaries of holdings, with examples of each of the classes of ownership used in Fig 3

The extension of holdings below the 700 foot contour has not been shown in Fig 3 except in the case of the State forests, for which the full outline has been preserved. The size groups of farms have been based on the following approximate limits

Large holdings	Land in holdings exceeding 500 acres
Medium-small holdings	Less than 500 acres, but exceeding 70 acres, generally exceeding 100 acres
Very small holdings	Less than 100 acres, generally less than 70 acres



The "overlap" of the last two categories was found desirable for classification in complex areas and for cartographical simplicity. "Joint ownership" refers to mountains where former rundale or runrig practices have left the ownership distributed between a number of the inhabitants of the townland, each individual's share being expressed as a proportion of the total assessed grazing capacity of the mountain, with the shares not being divided on the ground.

The proportions of land represented by the various size groups are very relevant to any attempt to assess the degree of marginality prevailing in the hill sheep industry. Holdings of over 500 acres offer scope for specialised sheep farming on a scale sufficient to provide an adequate income for an average family under present conditions. That a farm at the lower limit of this group cannot, however, properly be called large may be indicated by applying the rough rule that the rate of stocking of hill land should seldom exceed one Blackface ewe to each two acres. Holdings in the 100-500 acre category may provide a reasonable income for a small family if in the upper half of the bracket or if including a large proportion of inbye. Most hill farms in this category must, however, be considered, *prima facie*, as marginal, i.e. as probably not yielding an income to the farmer equal to that of a farm labourer after allowing for a return on invested capital. Farms of less than 100 acres in which hill land accounts for the greater part of the area are essentially marginal or sub-marginal, able to provide only a portion of the income needed by a typical family for a reasonable level of subsistence. On these small hill farms the rate of stocking indicated above is often doubled but with only one acre per ewe the health of the stock is endangered except in particularly favourable conditions.

Since the smaller the average size of holdings, the more farmers there will be in a given area, the size of unit is also relevant to any attempt to improve the quality of farming. It is not intended to imply that large farms are necessarily more efficient than small ones but their "accessibility" is greater for purposes of education whilst the larger scale of operations is likely to permit of more economies. The large number of small farmers in the Ulster hills may be indicated by the figures for the hill sheep subsidy payments. In 1952 flocks of over 200 ewes numbered only 145, accounting for 30 per cent of the total hill sheep. Most of these flocks would be on farms classed as "large" on the land ownership map, i.e. over 500 acres. There were 850 flocks of between 50 and 200 ewes, accounting for 44 per cent of the total sheep, and no less than 1,700 flocks each of less than 50 ewes and comprising 26 per cent of the total sheep. These figures suggest the difficulty of disseminating knowledge of improved techniques in Ulster.

The small size of the average hill farm in Ulster is emphasized by comparison with Kintyre. All the specialised hill sheep farms in Kintyre are over 250 acres, six being over 5,000 acres, and all but one of the farms which combine sheep and dairy farming exceed 250 acres. Consequently, almost all the hill land of Kintyre, which is equivalent to about half that of North Ulster, is accounted for by about 70 farms. In terms of flock size, all the specialised hill farms have more than 200 ewes each, as have three-quarters of the hill and dairy farms. More than 1,000 head of breeding stock are returned

by each of ten farms as compared with only one in Northern Ireland. The comparison reaffirms the view widely held that the process of amalgamation of farms which is proceeding slowly in Ulster must continue if there is to be a reduction in the high proportion of marginal and sub-marginal farms. A case of amalgamation of such holdings is illustrated in Fig. 4.

Any particular holding of hill land which is owned outright by an individual or by a particular family and used for hill farming purposes presents a comparatively simple problem for evaluating present condition, productivity and possible improvement. It is otherwise with the joint mountain and it is significant that although many of the strips of hill land which have resulted from the division of the great estates are much too small for economic and progressive utilisation, just as the accompanying arable patches are too small, the majority of owners of small farms prefer this method of division of their hill land rather than sharing common mountain with others of the townland.

The drawbacks to joint ownership are in large part obvious. Live-stock intermingle and hence disease is difficult to eradicate. Anyone who wishes to upgrade his sheep by using his own selected rams must take his stock off the hills at tupping time. All gathering and working is complicated. Apart from the quality of the stock, the quality of the land is apt to deteriorate under joint ownership. Grazing pressure tends to be badly controlled and lacking in balance. Strict observance of the rules governing the number of grazing stock is now comparatively rare, the actual degree of adherence to the stated souns varying from one townland to another. Basically, a soum is the pasturage needed for a cow, with equivalents for other stock. Commonly 5 sheep are equated to a cow, whilst a horse is regarded as 2 souns. In this simple system followers (young stock) are ignored although they may vary greatly. In other equations followers may be counted separately, whilst 8 sheep may be counted equal to a cow. Fraser Darling has commented on the complexity of souming arrangements in West Highland townships. He also notes<sup>9</sup> that the attitude to the souming rules varies "from law-abiding rigidity to complete neglect," and quotes an example from a Hebridean crofter-fisherman to show how things get out of hand.

"Suppose now I have a younger brother who doesn't inherit the croft as I do. He takes a quarter-acre feu on the common and builds himself a cott. Now, it's sorry I am for my brother and I say to him, 'Take the souming of a cow and five sheep from my tally and that will be all right.' All right it is, but the years go by, and I am forgetting I was after giving my brother that souming, and my tally is full again. And my brother, he forgets he is only a feuai and not a crofter and it's himself that has two cows and followers, and twenty sheep, whatever."

When deterioration in the pasture is observed it is seldom easy to get an alteration of the total numbers of stock put on the land, or to alter the sheep/cattle ratio, to get a complete overhaul of the drains, to improve the sward by other means, or replace the fencing. The difficulty of improving is less where only two or three persons are involved, other things being equal. In some cases although there

<sup>9</sup> Darling, F. F. *West Highland Survey* (Oxford 1955), p. 207.

may be twenty joint holders in a townland, only three or four may regularly put stock on a hill. Then it is customary for those who use the grazings to pay a kind of rent to the others for their shares. This, however, may not facilitate improvement owing to the need for the co-operation of the non-active tenants, the alternative to which is the acceptance by the active ones of the whole of the cost of improving, without reasonable certainty that they will benefit in proportion to their outlay. The position may be particularly difficult where some of the owners are absentees, having emigrated without relinquishing their holdings.

In Scotland, the problem of joint ownership of mountain land is bound up with the crofting problem and therefore subject to special inquiry and legislation. In Kintyre, which is not a crofting district, the problem is insignificant. In Ulster, joint ownership of hill land is widespread, and exists frequently in the acute form of ten or twenty owners on a particular mountain slope. This may be illustrated from the north-east slope of Sawel, the highest mountain of the Sperrin group. Rather more than 1,400 acres is shared by twenty-three lowland farms, the souming or grazing rights being allocated in fractions of 400. Thus, the two smallest holdings have seven four-hundredths each, and the largest one has thirty-two four-hundredths. A few miles away, on the northern slope of Mullaghshane the soums are in fractions of 313, there being 10 holders on an area of about 300 acres. On Slieve Gallion, the 500 acres or so of mountain land in one townland is shared by 11 holders in fractions of 132.

The Sperrin Mountains show ample evidence of management difficulties. There, where adherence to common grazing within the townlands is most extensive, and where in many of the townlands all those sharing the ownership of the mountain exercise their grazing rights to the full, the mixture of observance and neglect of the necessary practices of husbandry creates a baffling problem. The usual value of the soum is five sheep, though many consider this to be resulting in overstocking. In order to counteract this in one townland the value was reduced to four sheep some decades ago, but there is appreciation within the townland that the mountain is still overstocked. This townland is fenced from its neighbours, and there is annual appointment of a committee of four to watch over the grazings. Yet in spite of this attention to the souming, the practice of grazing cattle on the hills has disappeared as completely as it has in less closely regulated townlands. The concentration on sheep, which at present yield good prices for both wool and carcasses, is complete. Breeds of cattle, such as the Galloway, which are hardy enough to withstand the climatic conditions are almost unknown to the small farmers. There are undoubtedly difficulties including lack of knowledge of the handling of the breeds, and the risk to cattle from the extensive banks left by the turf cutting, but these should not be serious, the one can only be overcome by experience, the other is in the hands of the townland itself. In some of these townlands there is a growing appreciation of the desirability of a comprehensive drainage scheme but examples of co-operation to this end are rare.

Among the facts illustrated by the map of hill land ownership in Co. Derry (Fig. 3) is the predominance of large holdings and forest land in the northern part of the hills. In the Glenshane and Glenedra

areas there are a number of large holdings and forests, including those utilising the Londonderry Corporation catchment area, but there is also a significant proportion of land in small and very small holdings and in joint ownership. Westward, in the main mass of the Sperrins, joint mountain is predominant and large holdings rare. It is noteworthy that each of these divisions represents higher and less accessible land than the previous one, the culminating summit of the Sperrins, Sawel, being in joint ownership on all its flanks. South and east of Glenelly, where the general level of the land is again lower, very mixed conditions prevail.

As well as indicating the districts in which particular problems of farming connected with type of ownership or size of holding are likely to be met, some conclusions may be drawn on the likelihood of the establishment of new forests in the areas shown on the map. Bearing in mind that blocks should be as large and compact as possible for economic fencing and planting, the best opportunities for acquisition are likely to be in the zones of medium—small holdings. The largest holdings attract hill farming backed by substantial capital and the Forestry Division will only occasionally get opportunities to purchase these. Where there are many very small holdings, the time and cost of building up substantial blocks of land make acquisition uneconomic. The numerous interests involved generally rule out purchase of joint mountain land, except possibly in cases where all the shares are owned by two or three people. It is unfortunate that it is particularly in these areas where joint mountain is extensive that afforestation is most needed to provide employment and improve rural services and thus stimulate agriculture. Forestry, meanwhile, is thought of more generally as in competition rather than in co-operation with agriculture. In Scandinavian countries, however, silvicultural and agricultural activities are closely integrated, having evolved side by side in a climate more favourable to tree growth than to cultivation, and it would be helpful if a similar integration could be promoted in the British Isles.

In Northern Ireland it was not until the early 1930's that purchase for State afforestation had resulted in a significant amount of hill land being dedicated to forestry. During these years when hill farming, like other branches of agriculture, was suffering from a prolonged state of depression, the Forestry Division of the Ministry of Agriculture was able to acquire considerable properties with the very limited expenditure which its small grant permitted. Hence the new series of one-inch maps which the Ordnance Survey of Northern Ireland produced as a result of revision in 1937 and 1938 showed some diversification of the bare hills by pleasing patches of green where the young plantations were being established. Acquisition continued during the war, and in the following years. Nevertheless, when the Agricultural Inquiry Committee reported in 1946, it was able to say<sup>10</sup> "the percentage of land afforested in Ulster is the smallest of any country in Europe except Iceland." The Committee was rightly concerned with this state of affairs and said, "We believe that there can be few parts of the United Kingdom which would be more improved by afforestation than Ulster, and that there is an unanswerable case for going ahead with afforestation in a comprehensive way." After a further decade has elapsed there should still be few who would find

<sup>10</sup> Cmd 249, p. 82

fault with the general encouragement to afforestation that was thus offered, or with the extent of the programme which has been pursued unless to say that the funds made available for the work are still too small in relation to the national budget. Forestry in Ulster has now reached the stage (Plate 3) where it can begin to demonstrate the advantages which it brings to the country, apart from the purely productive aspect. Protection of adjacent land, reduction of water-logging and erosion, encouragement and facilities for the planting of shelter belts on farms, all these on the physical side are accompanied on the social side by counteracting rural unemployment and setting new standards in housing and roads in remote districts.

But because the Forestry Division is pursuing its work with commendable vigour at a time when sheep farming has again become profitable and increasing demands for water have to be met, there is rapidly developing a state of competition which apparently was not foreseen by the Agricultural Inquiry Committee. In addition to recommending a doubling in the rate of planting, the Committee noted that prior to the war the Government was reluctant to sanction more than £4 per acre for the purchase of land for afforestation, and continued, "We recommend that while land values approximate to their present levels, this figure should be raised to £8 per acre, free of all charges, including the cost of redeeming any land purchase annuity on the land. We have been told that at £8 an acre as a maximum all the land necessary can be acquired without encroaching on lands which could be better used for grazing or other agricultural purposes"<sup>10</sup>. It would thus appear that the Committee did not, envisage the withdrawal of good grazing land from stock rearing, yet it must have been evident that this had occurred in the past and must occur in the future, particularly if the Forestry Division's purchasing powers were raised so that they could compete with the increased value of the land for sheep farming. We may regret that the best land for grazing is also the best for afforestation, but this does not alter the facts. An authority charged with afforestation will naturally seek to produce the best forests possible, and can hardly be expected to refrain from purchase in the hope that the land might otherwise fall into the hands of a good sheep farmer. Where such land had passed into forestry before the war it was frequently possible to say that whatever the potential value the land was not in fact properly stocked with sheep at the time of the purchase and therefore the Forestry Division was merely putting to use land which was more or less completely neglected.

Now, however, hill farming is again fairly profitable and already the land available for sheep has been sufficiently reduced for disquiet to become common among the more progressive farmers and those concerned with a balanced use of the land. The existence of the problem has been widely recognised elsewhere in the United Kingdom and abroad and has led to numerous debates and arguments. Ulster cannot afford to ignore the problem, which will require a great deal of attention. Economic considerations alone cannot decide. The Agricultural Inquiry Committee were persuaded that "forestry represents the best economic use which can be made of certain areas

<sup>10</sup> Cmd 249, p 82.

of hill land. It provides a sound long term investment which begins to show returns after twenty years, and when the forests are well established, they will, in many cases, produce much better profits than if the land were used for hill grazing"<sup>10</sup> This could be the case but such statements assume, of course, much more than is justifiable as to the future courses of prices of both timber and livestock products, as well as of rates of interest. Furthermore, when argument becomes lively each side tends to quote figures which are most favourable to its own cause and this is easy to do when dealing with such varied physical conditions as are found on the hills of the British Isles. Indeed, in view of the impossibility of forecasting economic conditions twenty years ahead it is as well that there are other equally valuable criteria for judging the problem.

The Ministry of Agriculture is wise in not laying stress on the economic gains to be derived directly from afforestation in Ulster. Were the possibility of reward sufficiently attractive, it would not be necessary for the Government to devote public funds to the job. There are other more important reasons for an energetic public policy in planting, well stated before the British Commonwealth Forestry Conference in 1952<sup>11</sup>

"Forest policy in Northern Ireland is governed by three principal factors. Firstly there is the compelling need to make good the despoliation of home-grown timber resources caused by two world wars and to achieve a degree of self-subsistence in forest products at least equal to emergency requirements. Secondly there is a social problem, i.e., the need to provide employment and a viable economy in areas of serious under-employment, the existence of which not only impoverishes the areas themselves, but by causing a drift to the towns accentuates the social problems of the whole country. Afforestation projects in these areas (which are predominantly marginal land) offer an ideal solution by providing a source not only of immediate local employment but of potential national wealth. Thirdly, because of the inability of private planting, under present day economic conditions to make more than a marginal contribution to the solution of either of these problems, the principal share of direct action must inevitably be taken by the State."

The independent observer will agree emphatically that on both strategic and social grounds the case for a much greater area under forest is overwhelming and will welcome the accelerated programme which resulted in the area planted in the five years 1946-50 being as much as a quarter of the whole area planted in the preceding thirty years. In the next five years the rate of expansion was yet higher, the planted area being raised from 27,605 acres (44 square miles) in 1950 to 38,450 acres (60 square miles) in 1955. The long term aim is the establishment of 150,000 acres (234 square miles) of productive forest within the next half-century and to this end, land is being acquired as it comes on the market even though the rate of planting cannot be increased in the same proportion. That this is sound policy is emphasized by the position in Great Britain where the Forestry

<sup>10</sup> Cmd 249 p 82

<sup>11</sup> British Commonwealth Forestry Conference, 1952, General Statistical Statement, Northern Ireland (Belfast H M S O, 1952)

Commission fears that it will have to reduce its planting rate due to a hardening in the supply of land. There are other advantages in Ulster from purchasing well ahead owing to the smallness of many of the holdings which become available and the desirability of building these up over a period into economic units for forestry. Meanwhile, the land can be kept in agricultural use until it is planted. If the rate of purchase is maintained at a high level the Forestry Division may find it practicable to increase the rate of planting above the present level of about 2,500 acres per year. It may also appear reasonable to raise the target of 150,000 acres, since nearly half this area has already been acquired. It therefore becomes relevant to ask whether more hill land could be planted without endangering hill farming, bearing in mind the need for hill land not only for the products yielded by the sheep and cattle directly, but because the hardy creatures bred in the mountain environment provide the essential foundation for breeding flocks and herds throughout the lowlands.

If the whole of the 234 square miles of forest so far envisaged was established in hill country, it would account for about one-fifth of such country in the province. In fact much lower land of a marginal character in Fermanagh and West Tyrone is being acquired. This lower land is not hill sheep country and the affect of reafforestation on farming there is outside the scope of this paper though it may be remarked that the establishment of forests in this area is much needed to stimulate the economy. If these opportunities for forestry continue to occur in the western counties the contribution required from the hill country proper towards the achievement of the target will be substantially reduced. The question as to whether or not the target should then be raised to allow for afforestation of between 200 and 250 square miles of hill land in addition to the lower marginal land, the availability of which has introduced unexpected possibilities, then turns on the desirability of afforestation and the needs of hill farming. If it be accepted that a transfer of one fifth of the hill land to forestry could be accomplished without endangering the rearing of hill sheep and cattle, the beneficial effects of forestry on local economies would seem to be sufficiently established for the expansion to be authorised.

My personal opinion is that afforestation of one-fifth of the hill land need not endanger the production of hill stock, though certain qualifications are necessary. Firstly, the general level of utilisation of the hill land requires to be improved, and it is important that every endeavour should be made to ensure that as land is transferred year by year to forestry, its loss is made good by more efficient farming of the remainder. This means both continued rehabilitation of land and better stock management. Secondly, it is very desirable that land which has a very good record of livestock rearing should not be afforested simply because it is offered to the Forest authority at a price within their means. This may call for something more than even the close co-operation which exists at present between officials responsible for forestry and agriculture respectively.

In Great Britain a co-ordinating authority has been found necessary due to the purchase of large estates primarily for afforestation. It is bound to happen that when a considerable block of land is purchased for forestry there will sometimes be land which should be properly dedicated to stock rearing. It has been considered desirable for

financial and management reasons that the State should acquire the whole, but afforestation should be limited to parts not considered especially valuable for rearing. Clearly such planning means a sacrifice of land which would yield the best, perhaps, in trees, and therefore the Forest Authority should be treated that much more leniently in the economic returns expected from it. The nation will benefit more in the long run. Examples of such planning of land use, with benefit to both enterprises, can be seen in some of the estates in Scotland. These are well worth studying both for the success that they have achieved and the mistakes which have been made and can be avoided in the future. Their experience will be valuable if a similar need arises in Ulster, and if bold planning becomes necessary, it should be undertaken.

Finally, careful co-ordination with the forest and agricultural authorities is required for acquisition of land for water supply. It is very desirable that catchment areas should be either afforested or grazed as far as possible. The position here is becoming more satisfactory with increasing co-operation between the authorities concerned but it will become even more important as larger areas are involved. It is also very desirable that the maximum effort should be made to foresee future requirements in gathering grounds. The catchment areas provide the principal opportunity on the Ulster hills for the multiple use of land, stressed by L. Dudley Stamp as one of the most important principles of land use planning.<sup>12</sup> Observance of this point alone will greatly reduce the pressure of the full programme of afforestation on stock rearing.

With these provisos, then, I believe that we can not only justify adherence to the programme envisaged by the Forestry Division, but look forward to its extension. If, as reforestation extends, it can be preceded by wise and imaginative planning in which all interests are adequately represented, and accompanied by changes and improvements in hill farming, the next few decades may see great achievements in the restoration of the economy of the hill lands. Future generations will then be grateful for our investments in a physical environment which puts a premium on hardiness and resilience.

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#### DISCUSSION

*Mr V. Liversage:* Mr Chairman I think I shall be expressing the sentiments of the meeting when I thank the speaker for what has been a broad and suggestive survey of the problem of the uplands. Personally

<sup>12</sup> Stamp, L. D. *Applied Geography* in *London Essays in Geography* (ed. L. D. Stamp and S. W. Wooldridge) (London 1951).



I have felt a deal of pleasure in seeing the numerous attractive slides which have been shown. As an agriculturist, too, I have been refreshed to listen to the authentic professional jargon from a geographer.

I do not think everybody would accept all the conclusions which Mr Symons seems to consider justified. He seems to look upon the development of the hill land somewhat as Sir John Hunt wanted to climb Everest, "simply because it was there." There are some who consider that more weight should be given to the human factor and less to the land, that developing the hills is like trying to brush water uphill. They point to the historical trend away from the hills, the need for fresh capital if the trend is to be arrested or reversed, the comparatively low marginal return on capital due to the limitations of the land, and the necessarily high *per capita* cost of roads, schools, transport and other social amenities.

From an agricultural point of view improvement may be considered in relation to the hill land *per se*. It is in this connection that one thinks of pure Blackface or Cheviot sheep, and Galloway cattle. Alternatively hill land is looked upon as complementary to the lowland, a nursery for store cattle and sheep and for crossbred breeding sheep. The annual migration of animals from the hills to the plains is an important factor in the nation's agriculture, and it is this that has probably been the main factor prompting measures like the hill sheep and cattle subsidies and hill farming grants. Incidentally, the speaker assumes that because the hill farmer has not received fat cattle subsidy on his store animals he has been to that extent out of pocket, but most lowland beef producers would probably take the view that the beef subsidies have been fully discounted in competitive bidding for store stock.

In connection with this complementary function of hill farms, an intermediate type of animal is best suited to the needs of the lowlands, in the case of sheep a cross between a hill and a lowland breed. Such animals cannot withstand the rigours of hill conditions entirely, but have to be helped out at certain seasons. Thus the relative proportion of in-land to hill land on upland farms becomes a critical factor. In districts such as the Yorkshire Pennines one finds a well marked stratification of farming systems based on the relative amount of in-land on the farms. Those with little in-land go in for pure hill breeds. The surplus female stock pass to farms with more in-land, who cross them with rams of a lowland breed and produce a type of lamb suited to the needs of the lowland feeder. Cattle must in any case be foddered in winter, and so, however one looks at the matter, the critical factor is the proportion of in-land.

However, if there is enough in-land, dairying comes in to compete with stock raising. As the land is comparatively poor and exposed, dairying usually looks inefficient as compared with lowland dairying. Milk collection is expensive and the development of this enterprise tends to be frowned upon. But the problem of these farms is output. The monetary output per acre of hill land devoted to store stock raising is low and unless the farm is large the farmer is forced to raise it by milk production, which will usually yield something like twice the output per acre as compared with store stock. The farmer, too, needs to cash in on the family labour available. The twin factors of size of holding and proportion of in-land are thus vital to the question.

of the line of development of hill farms, and more information on the state of affairs in this regard would be a most useful contribution to our understanding of the hill farm problem

I conclude by proposing on our behalf a most hearty vote of thanks to the speaker for his most interesting and valuable contribution

*Dr Armstrong* Mr Symons is enthusiastic about the utilisation of hill land but when much valuable "lowland" land is under-developed—the agricultural statistics issued by the Ministry of Agriculture show, for example, that grass is not being fully utilised—it is difficult to see the economic justification for the expenditure of money in bringing marginal land into cultivation

Some reference has been made by the Forestry experts to the subsidies paid to farmers but presumably public money is also being expended in considerable amounts on reafforestation

*Mr R O Drummond* Mr Symons has, I think, put the case of the alternative uses of hill land as between agriculture and forestry very fairly It is true that, while the bulk of the land being acquired for forestry is poor marginal land, there will certainly be occasions when land is acquired for forestry which could carry a good stock of sheep Where this is likely to occur the Forestry Division always consult the agricultural branches of the Ministry and obtain their advice and blessing before proceeding to negotiate to acquire

Mr Symons said at one point that "the Forestry Authority will naturally seek to produce the best forest possible and can hardly be expected to refrain from purchase in the hope that the land might fall otherwise into the hands of a good sheep farmer" I agree that this may seem to be the case, but I must emphasise that I can recall several instances where County Agricultural Officers have advised that the area on offer to forestry was capable of development for agriculture, and where the Forestry Division refrained from making an offer for a period of a year or more, in the hope that it might be acquired for agriculture Only after this period, when no other offer was made, did the Forestry Division seek and receive a clearance to go ahead and negotiate to acquire the land for forestry

No doubt, Mr Symons is correct in saying that each side will tend to quote references which will support its own case They say "the Devil can quote scripture for his purpose" and in this case you may say that I am the Devil's advocate But perhaps I may be excused one reference The Chairman of the Forestry Section of the British Association meeting in Liverpool in 1953 stated that "where there is direct conflict in the case of poor hill land in Scotland the choice lies between nine pounds of mutton or two tons of timber," per acre per year

He went on to say that "In some cases afforestation did not even cause a drop in the number of sheep In Argyll some 57,000 acres had been planted yet the sheep population rose from 480,000 in 1930 to 503,000 in 1952"

As I understand it, Mr Symons's main case is that, in the best interests of the country, the target should be a balanced combination of agriculture and forestry, with each helping the other, and our efforts should be directed to this end I fully support this view

*Mr J Eaton* A factor which is touched on in Mr Symons's paper, but which perhaps deserves re-emphasising, is the much greater

employment provided in the marginal agricultural areas by forestry as compared with grazing. In terms of direct employment alone, forestry needs about ten times as many full time workers as the hill grazing type of agriculture, and the ultimate development of ancillary industries will tend to increase that disparity still further.

Moreover, as the forests are developing in remote areas where rural unemployment and depopulation are serious problems, they are serving as centres of economic stimulus—bringing better wages, housing conditions, public services—which help to stabilise the surrounding districts against depopulation. The general effect is thus in fact favourable to agriculture because of the resultant slowing down of the trend towards the abandonment of hill land. Indeed, there are known to be some specific cases of reversal of this trend, where employees of the Ministry have saved up out of their wages and bought farms in the district where they work which they then run as a family concern in addition to their forestry work.

In reply to Dr. Armstrong, it is true that a great deal of public money is being spent on forestry, but this is not a subsidy—it is an important capital investment programme. The money is spent partly on land, the value of which is then improved by the forestry programme, and partly on labour which, instead of drawing unemployment relief, is used in conjunction with the land to produce a valuable raw material. One of Northern Ireland's main economic disadvantages is the absence of locally-produced raw materials and the hill lands can make good that lack by being used for forestry, to which they are exceptionally well suited. Timber and timber derivatives already play an important role in the national economy and are likely to increase in importance as scientific developments enable more and more derivatives to be produced from the chemically-complex material that wood is.

*Mr R. H. Buchanan.* To the social geographer, interested in the problems of the rural community as a whole, Mr. Symons's paper has emphasised one important fact—it is that the hill lands are areas which are essentially unattractive to man. They are regions of difficulty, where man has to fight relentlessly and unceasingly against his physical environment to make a living, and where the reward for his labour is proportionately less to the effort he has to make. The derelict houses, the ruined field ditches, and the marks of the old spade-rigs, still showing faintly beneath the heather, all tell their own story. They remind us of the harsh times of the great Famine, when sheer pressure of population on the lowlands forced men to eke out a miserable subsistence on the hills. The desolation of these lands to-day reminds us, too, how transitory man's settlement of the hills has always been.

The problem of developing our hill lands is correspondingly smaller in Ulster than in Scotland, although the questions at issue are substantially the same. In Ulster, however, there are few extensive tracts of pure hill land, few large areas into which the glens and valleys fail to penetrate and bring with them the influence of the lowlands into the heart of the hills. The relationship of valley and hill, of lowland and highland has always been intimate in Ulster, as many studies of our rural past have shown.

It therefore seems to me to be fundamentally wrong to consider the

problem *in vacuo*, to isolate the hills from the land to which they belong. We must try to see the problem of the further utilisation of our hill lands against the background of the agricultural economy and of the rural community as a whole. Only by a careful examination of the economic and social problems involved can we see how our capital resources can best be utilised. It must be our aim to provide for the farmer on the hills social amenities comparable in every way to those enjoyed by his lowland neighbour. Without due consideration of this vital human factor all our schemes for the greater development of agriculture and forestry will surely fail.

*Mr Symons* I would like to thank those who have just spoken for their contribution, each of which adds a particular viewpoint to the discussion. As a geographer, I am seeking to present a picture of a type of environment and its economic problems without subjective bias for or against any one use and I do not advocate disproportionate expenditure of public money on developing hill land. But the output from the hill lands is vital to the farmers of the lowlands, and the value which is placed upon hill stock may be judged from the prices paid. Pedigree hill stock are exported all over the world and contribute in no small way to our dollar earnings. In the hills, as elsewhere, wisely invested money has a multiplier effect and may bring benefits out of all proportion to the original injection. By all means let us develop our more fertile lowlands to the maximum potential, but let us not deny progressive farmers and foresters on the hills a share in the investments just because there are lowlanders who have not yet rid themselves of rushes or installed electricity. I do not agree that man's settlement of the hills is transitory. Derelict farms and fields indicate maladjustment of the economy or forced clearances. If the economy is properly adapted to the environment there is no reason why there should not be a reasonable number of people living prosperously in hill country and producing much needed commodities. I would like to comment further on some of the points raised, but I see the Chairman is looking anxiously at the clock, so I must await another opportunity to pursue the discussion.