JUNE 1953 **BULLETIN No. 40**

Farm management

HILL AND UPLAND FARMING IN ROXBURGHSHIRE

A Survey of Three Parishes

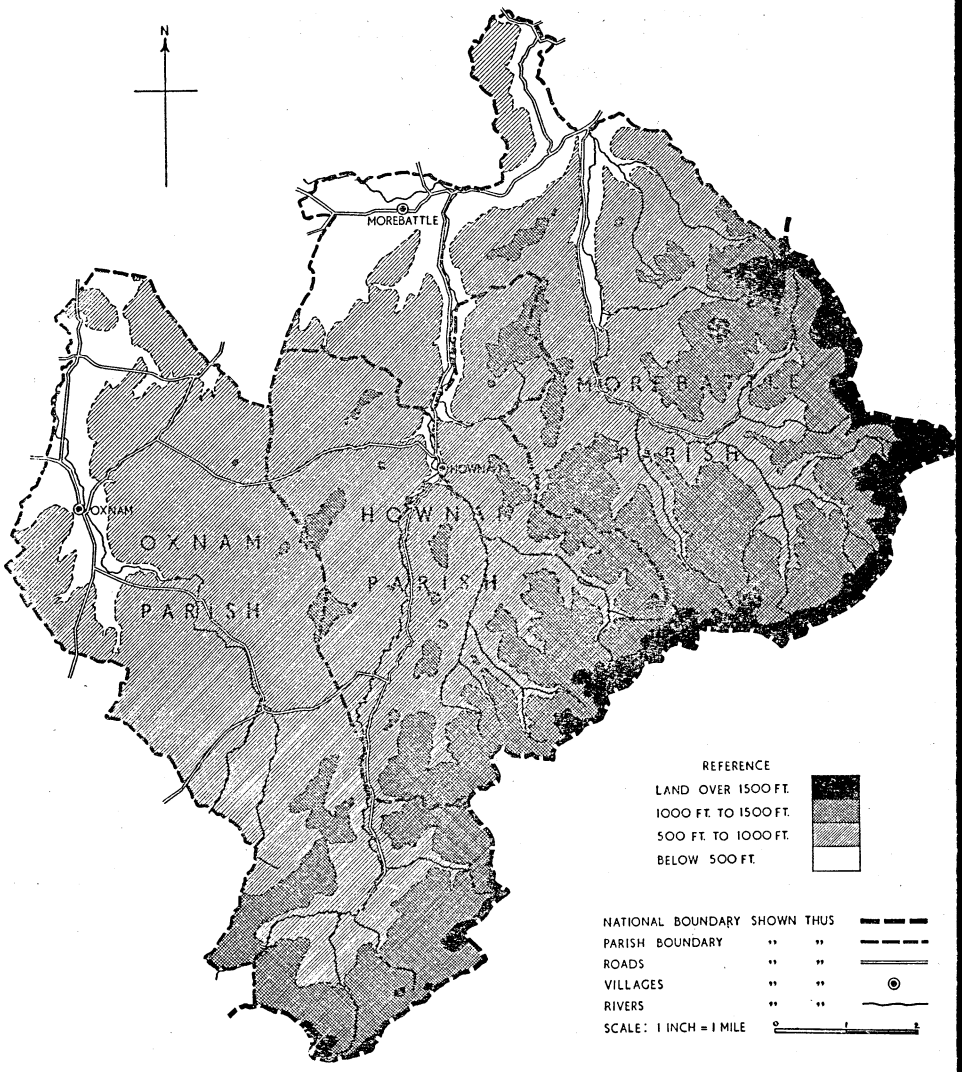
by

W. B. DUTHIE, B.Sc.

THE EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE

DEPARTMENT OF ECONOMICS

22 ROSE STREET, EDINBURGH 2



TOPOGRAPHICAL MAP OF THE PARISHES OF
MOREBATTLE, HOWNAM & OXNAM — ROXBURGHSHIRE

THE EDINBURGH AND EAST OF SCOTLAND
COLLEGE OF AGRICULTURE

DEPARTMENT OF ECONOMICS

22 ROSE STREET, EDINBURGH 2

HILL AND UPLAND FARMING IN ROXBURGHSHIRE

An Economic Survey of the Three Parishes of Morebattle, Hownam and Oxnam

AN INTERIM REPORT

by

W. B. DUTHIE, B.Sc.

DEPARTMENT OF ECONOMICS

STAFF.

D. WITNEY, B.Com.
J. D. NUTT, B.A., N.D.A.
D. M. R. LEASK, B.Sc.
W. B. DUTHIE, B.Sc.
C. J. BLACK, B.Sc., Dip.Agric.Econ.
J. A. MACLENNAN, B.Sc.
J. D. ROWBOTTOM, B.Sc.
B. PEART, B.A.
HELEN L. SMITH, B.Sc.
A. B. K. TRACEY, B.Sc.

RECENT PUBLICATIONS.

FINANCIAL RESULTS OF EAST OF SCOTLAND FARMS :—

Group	1946-47	1947-48	1948-49	1949-50	1950-51
	No. of Farms				
1. Hill sheep farms 2. Stock-rearing farms	52	48	54	52	53
3. Stock-raising and feeding farms 4. Arable farms 5. Dairy farms	153	143	184	175	178
	205	191	238	227	231

COSTS OF MILK PRODUCTION : 1945-46, 1946-47, 1947-48, 1948-49, 1949-50, 1950-51, 1951-52.

ECONOMICS OF LIVESTOCK PRODUCTION :—

(*a*) Winter Fattening of Sheep : 1947-48, 1948-49, 1949-50.
(*b*) Winter Fattening of Cattle : 1947-48, 1948-49, 1949-50.
(*c*) Commercial Egg Production : 1949-50, 1950-51, 1951-52.

ENTERPRISE COSTS : Economics of Silage-making in East of Scotland, 1950, 1951, 1952.

DAIRY LABOUR IN THE EAST OF SCOTLAND.

ECONOMICS OF BRACKEN ERADICATION, 1951 and 1952.

Inquiries regarding the above publications should be addressed to either the Secretary of the College or the Provincial Agricultural Economist.

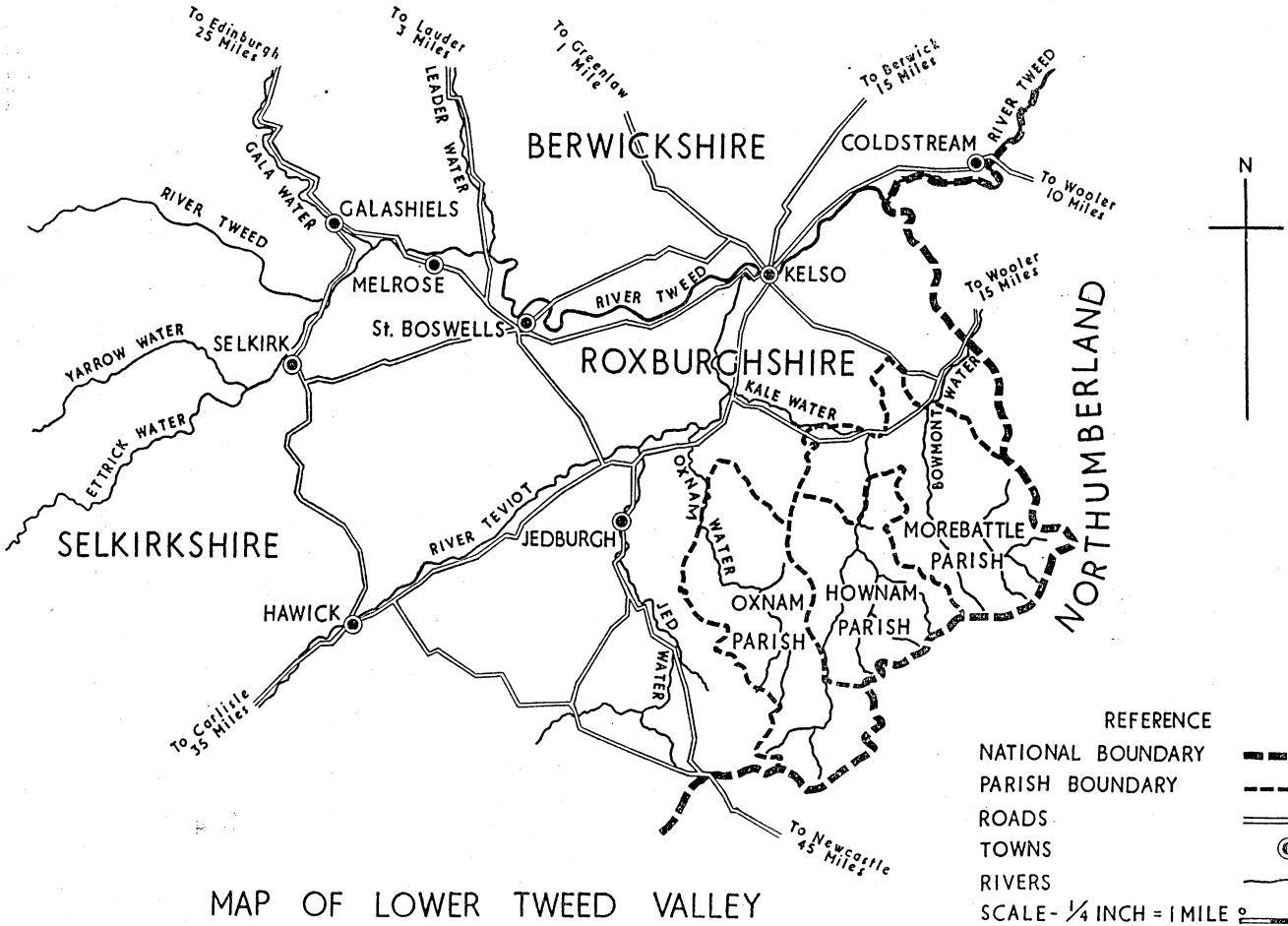
CONTENTS

HILL AND UPLAND FARMING IN ROXBURGHSHIRE

INTRODUCTION

At the request of the then Hill Farm Research Committee an economic survey of hill and upland farming in the vicinity of their experimental and research farm at Sourhope in Roxburghshire has been undertaken. It was decided to survey as many hill and upland farms as possible in the three parishes of Morebattle (in which Sourhope is situated), Hownam and Oxnam. During 1952, 25 farms were visited and surveyed for the year covering the 1951 lamb crop. This interim report deals only with the factual data collected on these visits to the farmers and shepherds concerned, supplemented by statistical data for each parish treated as a whole, kindly supplied by the Department of Agriculture for Scotland. Financial accounts on a continuing basis are being collected from as many of the surveyed farms as possible and further reports will be issued in due course dealing with the financial aspects of hill and upland farming in the area.

Similar surveys have been carried out by the other two Scottish agricultural colleges in the areas surrounding Glensaugh and Lephinmore, the experimental and research farms in the North and West of Scotland College areas respectively. The main purpose of these economic surveys is to provide the successors of the Hill Farm Research Committee, when appointed, with detailed information which, considered in conjunction with botanical, chemical and veterinary surveys also carried out, will help them to determine future research projects to be undertaken at these farms. They should also serve as useful guides to the Committee on conditions prevailing on hill and upland farms—two very important branches of the agricultural industry in all ~~those~~ three parts of Scotland.



MAP OF LOWER TWEED VALLEY

I. THE PARISHES SURVEYED

The three parishes of Morebattle, Hownam and Oxnam all lie in the south-eastern part of Roxburghshire, as will be seen from the map of the Lower Tweed Valley on opposite page. Sourhope Farm itself is to be found in Morebattle parish bounded on its eastern flank by the Scottish-English border, which incidentally marks the southern extremities of all three parishes at their highest elevations above sea level. In the three parishes the land rises from approximately 250 feet above sea level to a maximum of 2,382 feet, both extremes being found in Morebattle parish, but no farm with land below the 400-foot contour line has been included in the actual farms surveyed. Also on the map can be seen the general northerly direction in which the watershed lies in each of the three parishes. Distances from towns and other centres of population also are shown, the most important being the distance to the main marketing town supplying the needs of these hill and upland farmers, viz., Hawick, some 25 to 30 miles away from the area under consideration. Here is to be found a market for the sale of Blackface, Cheviot, Half-Bred and Cross store lambs and draft ewes, while suckled calves from the more elevated farms also find a ready market here.

Through the centre of each parish runs a fast-flowing stream, the Bowmont Water in Morebattle parish, the Kale Water in Hownam parish and the Oxnam Water in the parish of that name. During periods of heavy rainfall or of melting snows these three streams are all very liable to overflow their banks and do quite serious damage to the " in-bye," or enclosed, ploughable land on the farms under review. This in-bye land is, of course, rich, flat and fertile—the only bit of land that could possibly be so described—and is utilised mainly for the provision of winter keep for the cattle and sheep stocks ; hence its importance in the economy of hill and upland farming. However, when these floods occur periodically, as has been their wont of late, much of the valuable topsoil is washed away and lost to these regions. It may be replaced by topsoil from the gullies up on the hillsides but this is definitely inferior soil for crop growing and much expenditure has to be incurred to bring the land into full production again. More often than not much of the in-bye land is covered with stones of varying sizes and gravel after a flood and sometimes the cost of removing this debris is almost prohibitive.

Centres of population from which supplies of casual labour might readily be drawn are few and far between, each parish having a small village, but only Hownam village actually lies

sufficiently high to be included in the area surveyed. Casual labour from the other two villages would tend to be completely swallowed up by arable and semi-arable farms in their vicinities and hence is of little value to hill and upland farming. Each parish has a well-maintained tarmacadam road running in close proximity to its principal stream; but, unfortunately, regular bus services are non-existent in the Bowmont Water valley and they only run as far as Hownam village in the Kale Water valley and to Oxnam village in Oxnam parish. The roads up the Bowmont and Kale valleys continue right up into the hills, but, as if to complete their isolation, there is no suitable connecting road between the two parishes above 300 feet. Between Kale valley and Oxnam valley there is a passable road at an elevation of approximately 700 feet above sea level. The lack of connecting roads adds many miles to the already long distances to and from markets while the complete or partial absence of public transport does little to alleviate the serious labour situation among the hill and upland farms in the area.

The topographical map (see frontispiece) gives a close-up view of the three parishes and emphasises many of the points just mentioned. It will be noted that the highest and steepest land lies in Morebattle parish and in the south-eastern part of Hownam parish. Except for the extreme south of Oxnam parish the land there is less steep and a greater proportion has come under the plough than in either of surveyed areas of the other two parishes.

Parish Agricultural Statistics, 1921 to 1951

Through the courtesy of the Department of Agriculture for Scotland, 4th June statistics for each of the three parishes under review have been made available for the years 1921, 1931, 1941 and 1951; these cover labour, cropping and livestock. Tables I. to III., which follow, have been compiled by combining the three parishes into one unit to make the totals of a workable size.

From Table I. it will be seen that from 1921 to 1941 there was a steady decrease in the total number of workers employed followed by a slight improvement in the position in 1951. Actually the labour staffs of the three parishes shows an increase of 6·2 per cent in 1951 compared with 1941 but a drop of 25·3 per cent when compared with the 1921 figures. Even allowing for mechanisation and other labour-saving devices, which do not affect hill and upland farming to the same extent as arable farming, this drop of 25·3 per cent in the available work force can only be considered a

TABLE I. FARM LABOUR EMPLOYED, 1921 TO 1951: 3 PARISHES COMBINED

	1921		1931		1941		1951	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Number of Regular Male Workers :—								
Over 21 years	220	60·0	226	69·4	181	70·1	221	80·7
Under 21 years	43	11·7	51	15·6	49	19·0	25	9·1
Number of Regular Female Workers :—								
All Ages	62	16·9	35	10·7	10	3·9	12	4·4
Number of Casual Workers, both Sexes and of all Ages	42	11·4	14	4·3	18	7·0	16	5·8
TOTAL LABOUR STAFFS— BOTH SEXES, ALL AGES	367	100%	326	100%	258	100%	274	100%

serious drain to agriculture in these parts. This figure, moreover, masks several important changes which have occurred during the past 30 years: the sharp fall in the number of adult male workers employed between 1931 and 1941, followed by a recovery by 1951; the drop in the number of young men on the land, which has halved since 1941; the big—and apparently permanent—reduction in the number of women and/or casual workers employed. Between them these changes have radically altered the composition of the available labour force since 1921.

Most serious is the recent sharp decline in the number of young male workers under 21 years of age: 25 in 1951 or 9·1 per cent of the total as against 49 or 19·0 per cent in 1941. This increases the reliance placed on adult male workers, 80·7 per cent in 1951 as against only 60·0 per cent in 1921. And while the ages of these adults is not known exactly, many of them at the present time, especially the shepherds, are getting up in years and are not being replaced by younger men. What with war service or national service since the end of hostilities the country-bred youth of to-day, after two or more years of city or town life with their advantages of communal life and entertainment, is very loath to return to the hills of his childhood and settle down to the quiet lonely life of a hill shepherd in a cottage probably miles from the

nearest road. And it is not practical to recruit hill shepherds from town and city dwellers for the same reason.

The decline in the number of regular female workers and in the supply of casual workers must also be noted. The table, of course, deals with all types of farming in the three parishes, and the bulk of the female and casual labour will be taken up by the more arable farms lying lower down the valleys than by the hill and upland farms under review. Probably, these arable farmers are able to offer higher wages and more steady employment than the hill and upland farmers, who, however, could utilise such labour at certain rush periods of the year.

Table II. which follows sets out similarly at ten-year intervals the land utilisation of the three parishes combined.

TABLE II. LAND UTILISATION, 1921 TO 1951 : 3 PARISHES COMBINED

	1921		1931		1941		1951	
	Acres	Per Cent	Acres	Per Cent	Acres	Per Cent	Acres	Per Cent
Wheat	Nil	..	1	..	245	1·6	46	0·3
Barley	763	4·9	360	2·3	731	4·6	968	6·3
Oats	2,375	15·2	1,853	12·0	2,443	15·5	2,134	14·0
Potatoes	77	0·5	78	0·5	144	0·9	102	0·7
Turnips and Swedes	1,608	10·3	1,306	8·5	1,312	8·3	1,211	7·9
Other Crops	95	0·6	190	1·2	435	2·8	265	1·7
TOTAL TILLAGE	4,918	31·5	3,788	24·5	5,310	33·7	4,726	30·9
Rotation Grass Mown	768	4·9	1,116	7·2	1,128	7·2	1,476	9·7
Rotation Grass not Mown	5,149	33·0	5,866	38·0	3,946	25·1	5,331	34·9
Permanent Grass Mown	645	4·1	616	4·0	534	3·4	327	2·1
Permanent Grass not Mown	4,143	26·5	4,060	26·3	4,806	30·6	3,415	22·4
TOTAL CROPS AND GRASS	15,623	100%	15,446	100%	15,724	100%	15,275	100%
Rough Grazing	44,734	..	44,790	..	44,659	..	44,912	..
TOTAL AGRICULTURAL LAND	60,357	..	60,236	..	60,383	..	60,187	..

From the table it will be seen that there was a large change-over from cropping to grassland farming around 1931, with a complete reversal of the process by 1941. Due to war-time scarcities wheat was grown in these parishes in 1941, but the acreage grown by 1951 was much reduced and has been replaced by barley, which gives a better return in most years and has proved itself a better nurse crop than wheat. Oats is the most popular and easiest-grown grain crop grown in these

parishes and covers almost 50 per cent of the land under tillage crops every year. The bulk of the oat crop, certainly on the hill and upland farms, is consumed on the premises along with the straw. Potatoes have never been grown to a large extent in this area chiefly because of the lack of casual labour. The acreages shown in the table comprise small acreages on each farm for consumption in the farmhouse or by the workers. However, an effort was made during the war years to increase the acreage grown and by 1951, at 102 acres, it was still well in excess of the pre-war figures shown. Turnips and swedes still compose nearly the whole of the root break though the acreage grown has decreased gradually throughout the years, being partly replaced by other crops such as rape, kale, silage and mangolds. Total tillage in 1951 almost equals the figure for 1921, and exceeds the 1931 total by almost 1,000 acres ; but it still falls short of the high 1941 figure by approximately 600 acres.

The acreage of rotation grass cut for hay has increased throughout the years, though it should be stated that 1951 was an exceptional year for hay. The previous year's hay crop had been very difficult to secure because of the wet summer of 1950 ; the hard winter of 1950-51 and the scarcity of hay sent prices soaring up to over £20 per ton in January 1951 with the result that increased acreages of hay were cut in 1951. Under normal conditions it is doubtful if there would have been much increase in the acreage cut in 1951 over 1931 and 1941. The acreage of permanent grass mown has decreased gradually since 1921, though it must be emphasised there was a big change-over from permanent grass to rotational grass since the beginning of the last war. Much of the old permanent grass was ploughed up to help the war effort and after a rotation it has been laid down to rotational grass as being more productive.

From the table it will be observed that almost three-fourths of the total agricultural area of the three parishes is taken up by mountain and heathland or rough grazing suitable only for the maintenance of the hardiest breeds of sheep such as the Blackface and Cheviot all the year round and for summer grazing of cattle. Land of this character occupies approximately 76 per cent of the total agricultural area of the parish of Morebattle, 81 per cent of that of Hownam and 65 per cent of that of Oxnam.

Statistics giving the changes in livestock numbers for the three combined parishes from 1921 to 1951 are to be found in Table III. set out below.

As would be expected the number of work horses has declined rapidly within the last twenty years with the advance

of farm mechanisation. The number of work horses in 1951 at 70 is only about 25 per cent of the number carried in 1921. However, the love of fox-hunting and point-to-point racing, with the close proximity of four packs of foxhounds, has

TABLE III. LIVESTOCK NUMBERS, 1921 TO 1951: 3 PARISHES COMBINED

	1921	1931	1941	1951
Horses—				
Work Horses	273	254	191	70
Other Horses and Ponies	124	69	88	94
TOTAL HORSES	397	323	279	164
Dairy Cattle—	(a)	(a)		
Bulls (including Bull Calves)	30	43	15	6
Cows and Heifers in Milk and in Calf	422	655	323	251
Young Stock 2 years old and over	369	388	31	12
do. 1 to 2 years old	326	544	62	43
do. under 1 year old	346	481	101	54
TOTAL DAIRY CATTLE	1,493	2,111	532	366
Beef Cattle—				
Bulls (including Bull Calves)	Separate details for dairy and beef cattle not available		28	68
Cows and Heifers in Milk and in Calf			456	1,076
Young Stock 2 years old and over			260	301
do. 1 to 2 years old			498	507
do. under 1 year old			522	855
TOTAL BEEF CATTLE			1,764	2,807
TOTAL CATTLE	1,493	2,111	2,296	3,173
Sheep—				
Rams	844	983	899	1,024
Ewes kept for breeding	33,874	34,334	32,913	29,948
Other Sheep—1 year old and over	11,087	12,401	9,560	8,828
do. —under 1 year old	37,879	40,349	30,643	30,177
TOTAL SHEEP	83,684	88,067	74,015	69,977
Pigs—TOTAL PIGS	244	297	349	404
Poultry—TOTAL POULTRY	13,557	21,123	5,358	8,045

(a) Includes both dairy and beef cattle.

resulted in the number of other horses and ponies (mainly hunters) being well maintained and even increased since 1931.

The most interesting and instructive figures in the table concern the cattle numbers, though it is unfortunate that dairy and beef cattle figures cannot be separated for the years

1921 and 1931. Very noticeable is the steady increase in the total numbers of cattle from 1,493 in 1921 to 3,173 in 1951—a very encouraging sign. Between 1941 and 1951 there has been a drop in the number of dairy cattle from 532 to 366, but a much more than compensating increase in the number of beef cattle which has risen from 1,764 to 2,807. The greater part of this recent increase in beef cattle numbers arises from an increase of 620 in the number of beef cows over the same ten years. Many of these cows are to be found on the hill and upland farms where incentives to cattle rearing include the Hill Cattle Subsidy, the Calf Subsidy and the Attested Herd Bonus, and a ready sale for suckled calves in October, not to mention the improvement to the grazing sward by the mixed grazing of cattle and sheep. Dairy farming plays a very small part in the agricultural economy of any of these three parishes partly because of the absence of any large centres of population and the lack of suitable buildings. Included in the number of dairy cows in the table are many dairy-type cows kept on the farms solely to provide milk for the farmer's own household and the workers, while shepherd's cows of a dairy type to produce milk for weakly lambs also account for some of the number. The majority of these "dairy" cows are mated with beef-type bulls to produce beef-type calves, so that actually they play quite a large part in beef production.

The numbers of sheep, according to the table, reached a high level around 1931 when grassland production had increased at the expense of tillage (see Table II.), but the total numbers had fallen by 1941 and fell further still by 1951. The decrease in 1941 would be largely due to the ploughing up of much of the grassland for food production, but the decrease in 1951 can be partly attributed to the increase in the cattle stock numbers at that date. An interesting comparison can be made between the approximate lamb crops for the four years, *i.e.* the number of sheep under 1 year at 4th June treated as a percentage of the number of ewes kept for breeding at the same date. These are 1921—111·8 per cent, 1931—117·5 per cent, 1941—93·1 per cent, and 1951—100·8 per cent; this bears out a point which is emphasised later in this report, viz. that while 1951 was a disastrous lambing season in some areas, this small part of Roxburghshire was not so badly hit. The majority of the other sheep over 1 year old are ewe hoggs to be brought into the breeding flock in the autumn. The steady decrease in the numbers can be explained by the decrease in the size of the breeding flocks allied to the gradual discontinuance of the older practice of keeping wedder hoggs over 1 year old.

Pig numbers show a welcome increase after each ten-year period but pig rearing and feeding is very much of a side-line in these three parishes. One would have expected a larger increase in the numbers between 1941 and 1951, due to the shortage of pig meat and the guaranteed prices, but the rate of increase has remained steady since 1921, *i.e.* an increase of 50 pigs every ten years. Poultry numbers on the other hand show large variations from year to year, chiefly because of the cessation of poultry keeping by one large-scale farmer in the nineteen thirties. There is, however, a commendable increase in poultry numbers between 1941 and 1951, once again attributable to controlled prices.

From the foregoing tables it will be seen that the agricultural output of the three parishes must depend largely on sheep, cattle and the sale of oats and barley at the present time. Comparing 1931 with 1921, the increase of some 950 acres of grassland accounted for an increase of some 4,400 sheep and 600 head of cattle ; this coincided with a decreased labour staff. The reduction of some 1,250 acres of grassland between 1931 and 1941 led to a reduction in sheep numbers of 14,000 but an increase of 200 head of cattle with a still smaller supply of labour. Between 1941 and 1951 an increase of 135 acres of grassland has accompanied the replacement of 4,000 sheep by almost 900 head of cattle ; this should lead to increased output in terms of both weight of food produced and in monetary value.

The Actual Area surveyed

As was mentioned earlier only hill and upland farming in the three parishes was to be the subject of the economic survey, so Table IV., set out below, details the proportion of each parish surveyed.

From the table it will be seen that the majority of the rough grazing has been included in the farms actually surveyed but only a very small percentage of crops and grass. Over the three parishes some 72·4 per cent of the total rough grazing is included in the survey and only 21·8 per cent of the total crops and grass is included, while of the total area of agricultural land 59·6 per cent is covered by the surveyed hill and upland farms. The main differences between the three parishes can also be seen from a closer study of the table. Morebattle parish is the largest of the three and has 77·4 per cent of its agricultural area classified as rough grazing ; Oxnam, the next largest parish, has 66·4 per cent of its area under rough grazing, while Hownam has 81·4 per cent of its total area consisting of rough grazing. Of the actual area of hill

and upland farming surveyed the percentages of rough grazing to total agricultural lands were as follows: Morebattle 93·7 per cent, Hownam 90·5 per cent, and Oxnam 88·4 per cent. Thus it will be seen that as one moves west through the three parishes the hills become less rugged and steep and the percentage of in-bye land increases. Hence the proportion of hill farms surveyed to upland farms decreases as the same route is followed. In actual fact, of the 25 farms surveyed Morebattle parish contains five hill farms and two upland

TABLE IV. PROPORTION OF EACH PARISH SURVEYED, 1951

	Morebattle	Hownam	Oxnam
Crops and Grass— (acres)			
Whole Parish	5,331	3,005	6,939
Survey Area	725	1,034	1,572
Proportion surveyed (%)	13·6%	34·4%	22·7%
Rough Grazing— (acres)			
Whole Parish	18,216	12,966	13,730
Survey Area	10,732	9,855	11,929
Proportion surveyed (%)	58·9%	76·0%	86·9%
Total Agricultural Area—(acres)			
Whole Parish	23,547	15,971	20,669
Survey Area	11,457	10,889	13,501
Proportion surveyed (%)	53·2%	68·2%	65·3%
Number of Breeding Ewes—			
Whole Parish	11,264	8,272	10,412
Survey Area	6,359	5,845	6,453
Proportion surveyed (%)	56·5%	70·7%	65·3%
Number of Breeding Beef Cows—			
Whole Parish	336	317	423
Survey Area	115	199	117
Proportion surveyed (%)	34·2%	62·8%	27·7%
Number of Regular Workers employed—			
Whole Parish	100	54	104
Survey Area	29	25	31
Proportion surveyed (%)	29·0%	46·3%	29·8%

farms, Hownam parish four hill and five upland farms, and Oxnam parish three hill farms and six upland farms.

Looking now at the sheep stock the seven farms in Morebattle parish account for 56·5 per cent of the total number of breeding ewes in the parish. These will be mainly of South Country Cheviot and Blackface breeds on the hill farms and North Country Cheviots and Half-Breds on the upland farms. These last two breeds will also comprise most of the other

sheep in the parish not covered by the survey. Moving through Hownam parish to Oxnam parish, the proportion of North Country Cheviots to South Country Cheviots and Blackfaces increases as the proportion of rough grazing decreases.

Compared with the number of breeding ewes of which the 25 hill and upland farms carry more than half in all three parishes, the proportion of breeding beef-type cows is small, being only 27·7 per cent of the total in Oxnam parish, 34·2 per cent in Morebattle and 62·8 per cent in Hownam parish. This is because of the almost complete absence of dairy farming in the area. Herds of beef cattle are maintained on the great majority of the farms in the three parishes.

As would be expected the hill and upland farms with their relatively small labour staffs for their sizes do not carry a very high proportion of the total labour staffs of the whole parishes. Only in Hownam parish does the number of regular workers employed on the surveyed farms approach half of the total parish supply.

Without trespassing on the botanists' preserves too much it is sufficient to state at this stage that the bulk of the rough grazing is of a grassy nature and hence very suitable for the Cheviot breed of sheep, whether North or South Country type, and for the grazing of all types and ages of cattle. Heather, however, does exceed the grasses in small areas but does not grow strongly as in the west and north of Scotland. The Blackface breed of sheep seems to make better use of the heather than does the Cheviot and hence it is to be found in greater numbers where heather is present. As will be shown later there has been quite a change-over from South Country Cheviots to Blackfaces all over the predominantly grassy hills of the Border counties of Roxburgh, Selkirk and Dumfries, because of the present system of payment by weight for the finished product, *i.e.*, fat sheep.

The rainfall in the survey area is very low for such elevations, just exceeding 30 inches per annum. In a dry summer this can be very serious as the hills are then liable to " burn up " with consequent loss of productivity. Drainage of this land, some of which tends to hold the water and become boggy in winter, is therefore a very tricky business. Many of the hills are quite flat on the top and here in many parts are to be found peat banks which are utilised to supplement the shepherd's fuel supply.

The scarcity on the actual hills themselves of shelter belts, which in addition to providing shelter to both cattle and sheep help to maintain a steady water table, is a point which struck the writer very forcibly on his travels over the area. It is also quite possible that the draining away of the water

from the hills helps to maintain the growth of bracken which is very prevalent in the area. Fortunately, the bracken in these parts has only in a few places reached the stage whereby all other vegetation is smothered completely. Under a scheme financed by the Agricultural Research Council quite large acreages of bracken are in process of being eradicated by an experiment whereby the Scottish Machinery Testing Station have during 1951 and 1952 been testing four different machines on bracken in Bowmont and Kale valleys. The possibility of improving easily accessible land is greatly enhanced.

The Year of Survey

It was agreed that the year covering the birth and disposal of the 1951 lamb crop should be the year chosen for this initial economic survey in all three College areas. Unfortunately, largely because of the severe weather experienced in the early months of the year, 1951 cannot be called a normal year: but then, can anyone say what a normal year is? Snow, frost, thaw and rain alternated up to lambing time, and in many areas in the South of Scotland pockets of snow were still visible in the month of June. However, according to statistics published later on in this report and from a glance at Table III. on page 14, it will be seen that this part of Scotland fared not too badly as regards lambing percentages despite the severity of the weather. In addition the wet summer of the previous year had hindered many hill and upland farmers from securing their hay crops in good condition, so that between scarcity and dire necessity these farmers were forced to pay upwards of £20 per ton for that commodity early in 1951 with haulage charges over and above. Hence, it will be seen that up to summer 1951 both these types of farmers did not have their troubles to seek. However the silver lining appeared when the 1951 wool cheque arrived and store lamb and draft ewe prices showed welcome increases over the previous year.

Farms and Farm Businesses in Survey Area

While there is no definite dividing line between the conception of what forms a hill farm and what forms an upland or stock-rearing farm, it may help at this juncture to mention the main differences between the two. Hill farms in the South of Scotland normally cover fairly large expanses of country, seldom less than 500 acres and often extending to 3,000 or

4,000 acres or more. They usually average around 2,000 acres in size and of this anything from 90 to 100 per cent is classified as mountain and heathland (or rough grazing). This is usually known as out-bye or hill land, the balance (if any) being called in-bye land. This is usually situated near a stream or burn and is enclosed by dyke or fence ; it is ploughable and capable of producing crops of oats, turnips and hay for home consumption. The breeds of sheep carried are of the hardy Blackface and South Country Cheviot breeds, which alone can survive on the hills the whole year round. The cattle stock at these altitudes, especially if out-wintered, are usually of the Galloway type, either pure or crossed.

Upland farms on the other hand are usually found at lower altitudes than the previous type and usually vary in size in the Border country from 300 to fully 1,000 acres. They have a good deal of in-bye land in crops and grass, and very often have an extensive hill outrun too, but the proportion of in-bye land to the total area varies from 10 to about 50 per cent. Crops grown comprise oats, barley, hay and turnips in the main, some for home consumption and the surplus for sale. While Blackface and/or South Country Cheviots may be kept on the out-bye land, it is common practice to find North Country Cheviots or even Half-Bred sheep kept on the in-bye grazings. As regards the cattle stock which usually run on the hill in summer and on the in-bye land or indoors in winter, Aberdeen-Angus, Shorthorn or Hereford bulls are mated to Blue-Grey or other crosses.

Of the 25 farms surveyed in the three parishes, 12 can safely be classified as hill farms and the remainder as upland farms answering to the above descriptions. The 12 hill farms can be further sub-divided into (*a*) three single units with the farmer in residence in the farmhouse and hence in complete control of the day-to-day working of the farm ; (*b*) three " led " farms run in conjunction with stock-rearing and arable farms outside the survey area. (Here the head shepherd is almost in complete control, being visited approximately weekly by the farmer himself) ; (*c*) three farms run in conjunction with two stock-rearing farms included in the survey, and (*d*) three hill farms run by farmers who are not resident on the farm but stay ten to twenty miles away.

Of the 13 upland farms, eight are units on which the farmer (or manager in one case) is resident. These eight farms can be further classified as (*a*) four farms run as single units ; (*b*) four farms run in conjunction with one or more hill or upland farms included in the survey. The remaining five upland farms where the farmer is not in actual residence comprise one farm run in conjunction with an arable farm

outside the survey area and four which co-operate with other upland farms in the survey area.

Thus it will be seen that of the 25 farms surveyed only seven can truly be termed single-farm businesses with the farmer in residence in the farmhouse. Other three units can be said to be single units run by remote control with the farmer not living in the farmhouse. Four farms surveyed can be termed "led" farms, all being parts of two-farm businesses with the "home" farm outside the survey area; other four farms form themselves into two pairs of two-farm businesses all within the survey area; three farms surveyed form themselves into another farm business and the remaining four farms form another single business. In all there are eighteen farm businesses fully or partly covered in the surveyed farms, *i.e.* ten single-farm businesses, six two-farm businesses, one three-farm and one four-farm business. As it was possible to obtain fairly complete data for every single farm even when it formed part of a two-, three- or four-farm business, it has been decided to treat the farms as individual units, *i.e.* twelve hill farms and thirteen upland farms in the remainder of this report.

After this introduction and preamble on the general nature of the agricultural industry in the area selected and of the complexity of farm businesses encountered in the actual survey area, the most important factors affecting the 25 farms surveyed will now be dealt with in some detail from information collected regarding them. For this purpose Section II. deals firstly with the twelve hill farms on such points as size, land utilisation, rental values, sheep and cattle stocks and the labour position. In Section III. which follows, the same points will be dealt with for the thirteen upland farms, after which certain considerations of the actual hill land itself will be given covering all 25 farms in Section IV.

II. HILL FARMING

Land Utilisation

The twelve hill farms surveyed, consisting of five in Morebattle parish, four in Hownam parish and three in Oxnam parish, cover a total area of 24,532 acres, *i.e.* they average 2,045 acres in extent. Of this 96·4 per cent or 1,971 acres comprises mountain and heathland and some 74 acres or 3·6 per cent is classified as in-bye land, enclosed and capable of cultivation. These are average figures and the range in each case is fairly wide. Concerning total size of farm, the range

varies from 650 acres in one unit of a multiple-farm business to 3,625 acres, which actually comprises two adjoining farms run as one unit. Table V. set out below shows the distribution of the twelve farms by size and by parish.

TABLE V. SIZE DISTRIBUTION OF 12 SURVEYED HILL FARMS: 3 PARISHES

	Under 1,000 Acres	1,001 to 2,000 Acres	2,001 to 3,000 Acres	Over 3,000 Acres	Total
Number of Farms :—					
Morebattle . .	1	3	..	1	5
Hownam . .	1	2	..	1	4
Oxnam . . .	..	..	1	2	3
TOTAL NUMBER OF FARMS . .	2	5	1	4	12

The acreages of in-bye land vary from 30 to 170 acres or for better comparison from 1·6 per cent to a maximum of 7·8 per cent of the total area. The percentage distribution of the in-bye land is shown in Table VI. below, where it will be noticed that eight out of the twelve farms have less than 4 per cent of their land classified as in-bye.

TABLE VI. PERCENTAGE DISTRIBUTION OF IN-BYE LAND: 12 FARMS

	Not exceeding 2%	2·1% to 3·0%	3·1% to 4·0%	4·1% to 5·0%	Exceeding 5%	Total
Number of Farms :—						
Morebattle . .	1	..	3	1	..	5
Hownam . . .	1	..	1	1	1	4
Oxnam . . .	..	1	1	..	1	3
TOTAL NUMBER OF FARMS . .	2	1	5	2	2	12

There is little, if any, difference to be noted in the percentage distribution of in-bye land between the individual parishes.

Regarding the use made of this in-bye land, the only grain crop grown is oats, largely because the farmer can be sure of

obtaining some return from it grown at altitudes exceeding 550 feet above sea level, but also because of the excellent feeding value of both grain and straw. Turnips and swedes form the main green crop, with a few acres of rape and kale for the sheep and a few potatoes for the farmhouse and workers. In every case some hay is cut for the sheep and cattle for the winter.

Table VII. which follows shows (*a*) the percentage of the in-bye land which was under crops other than hay in 1951, and (*b*) the percentage which was cut for hay.

TABLE VII. UTILISATION OF IN-BYE LAND, 1951

(*a*) PERCENTAGE IN-BYE LAND UNDER CROPS OTHER THAN HAY

	Nil	10% to 15%	15·1% to 20%	20·1% to 25%	Exceeding 25%	Total
Number of Farms :—						
Morebattle . .	2	1	1	1	..	5
Hownam . .	3	1	..	..	..	4
Oxnam . .	..	..	..	3	..	3
TOTAL NUMBER OF FARMS . .	5	2	1	4	..	12

(*b*) PERCENTAGE IN-BYE LAND UTILISED FOR HAY PRODUCTION, 1951

	Not exceeding 30%	30·1% to 40%	40·1% to 50%	50·1% to 60%	Exceeding 60%	Total
Number of Farms :—						
Morebattle . .	..	1	2	1	1	5
Hownam . .	..	1	1	1	1	4
Oxnam . .	2	1	..	..	..	3
TOTAL NUMBER OF FARMS . .	2	3	3	2	2	12

Almost half of the twelve hill farms never see a plough at all during the course of the year, the in-bye land being kept only for hay and grazing. From a national point of view this is not a good sign, as increased output of both cattle and sheep could be obtained by the production of winter feed by means of a certain amount of arable cropping; but from the individual farmer's point of view this would probably not be economical. The cost of implements (whether hired or purchased),

the short growing season, the uncertain weather at these altitudes and the relatively small yield of the ultimate crop combine to make crop production a somewhat hazardous job, and deter some hill farmers from using the plough at all. This compels them to rely completely on a sheep economy to the exclusion of breeding cattle.

The average percentage of in-bye land under crops other than hay was 15½ per cent, varying from nil to exactly 25 per cent, while the average percentage of in-bye land off which a hay crop was taken was 42·5 per cent, ranging from 27·6 per cent to 87·5 per cent. Thus the average hill farm surveyed was 2,045 acres in extent, of which 1,971 acres is classified as rough grazing, while of the remaining 74 acres in-bye land 11 acres are under crops such as oats and green crop, 31 acres of hay and 32 acres under grass.

Rental Values

Because of the high percentage of rough grazing the rental values per acre are not high, but it is impossible to separate the assessed rents of the in-bye land from the out-bye. The rents vary from 1s. 8d. per acre to 5s. 7d. per acre, with an over-all average of 3s. per acre. The distribution of the rental values per acre by parishes is set out in Table VIII. below; once again there is little variation between the parishes.

TABLE VIII. DISTRIBUTION OF RENTAL VALUES PER ACRE: 12 HILL FARMS

	Not exceeding 2/-	2/1 to 3/-	3/1 to 4/-	4/1 to 5/-	Exceeding 5/-	Total
Number of Farms :—						
Morebattle . .	1	..	3	..	1	5
Hownam . .	2	..	..	1	1	4
Oxnam . .	..	2	1	..	..	3
TOTAL NUMBER OF FARMS . .	3	2	4	1	2	12

The above-mentioned rental value of 3s. per acre agrees very closely with figures given in the Department of Agriculture for Scotland's publication 'Types of Farming in Scotland,' where, in Table 40, the average rent per acre for 233 hill sheep farms in the South-East of Scotland—somewhat larger than the average size of hill farms mentioned above—

was 2s. 10d., a higher figure than in any of the other hill-farming areas in Scotland. Though the Department's figures are concerned with the year 1947, there have not been many increases in rents between that year and 1951, and it certainly looks as if the 12 hill farms surveyed lie in the area with about the highest average rental value per acre for that type of land in Scotland.

Sheep

Only two breeds of sheep—the Blackface and the South Country Cheviot—are to be found on the twelve hill farms under review, these being the only two Scottish breeds which up to now have proved themselves able to survive throughout the winter on these hills. Because of the large size of the individual farms, many possess more than one hirsel and it is quite common to find both breeds of sheep kept on the same farm, each under the care and supervision of one or more shepherds and kept entirely separate. In point of fact three of the twelve hill farms carry Blackface stock only, four carry stocks of South Country Cheviot only and five carry stocks of both breeds. In every case up to 1951 the two breeds were bred pure on the hills.

Even though the South Country Cheviot is indigenous to these parts, it is outnumbered by the Blackface breed according to figures collected showing ewe numbers at marking time 1951. There were 6,297 Blackface ewes and only 5,452 Cheviot ewes on the twelve farms. These totals allied to the number of acres of rough grazing, namely 23,655, give an average stocking intensity of 2·0 acres of rough grazing per ewe. For the twelve farms this figure varies from 1·6 to 2·6 acres per ewe, and Table IX. set out below shows the distribution of the intensity of stocking on these farms.

TABLE IX. Stock Intensity in Acres of Rough Grazing per Ewe: 12 Hill Farms

	Not exceeding 1·75	1·76 to 2·0	2·01 to 2·25	2·26 to 2·5	Exceeding 2·5	Total
Number of Farms :—						
Morebattle . .	2	2	..	1	..	5
Hownam . .	1	2	1	..	..	4
Oxnam . .	..	..	1	1	1	3
Total Number of Farms . .	3	4	2	2	1	12

It should be remembered that stocking intensity and stocking capacity are two very different things—the latter cannot be measured in any tangible terms—but because of the long experience of hill farming which these twelve farmers have, it is fair to assume that there will not be much difference between the two terms in actual practice on the farms surveyed. Of course, other factors such as the presence or absence of cattle and the length of time cattle have been kept on the hills can have quite an appreciable effect on the result, as well as the extent and strength of the bracken menace. From Table IX. it will be seen that the intensity of stocking is greater in Morebattle and Hownam parishes than in Oxnam parish, in which, however, the cattle stocking per farm is heavier as will be shown later.

Despite the severe weather in the spring of 1951 the lamb crop on these twelve farms was in the majority of cases quite good compared with other districts in Scotland, even other districts in the South-East of Scotland. Taking both breeds together and using the number of lambs at marking time as a percentage of the number of ewes at the same time as a basis, the average lamb crop was 90·1 per cent. The South Country Cheviot breed fared slightly better than the Blackface breed, averaging 92·6 per cent against 87·9 per cent. Table X., which follows, sets out the distribution of the lamb crops by breeds and by parishes.

TABLE X. 1951 LAMBING PERCENTAGES BY BREEDS AND BY PARISHES: 12 HILL FARMS

Breed	Not exceeding 60%	61% to 70%	71% to 80%	81% to 90%	91% to 100%	Exceeding 100%	Total
Number of Flocks :—							
South Country Cheviot	..	..	1	2	5	1	9
Blackface	1	..	1	1	3	2	8
Both Breeds	1	..	2	3	8	3	17
Number of Flocks :—							
Morebattle	..	..	..	1	5	1	7
Hownam	1	..	2	1	..	1	5
Oxnam	..	..	..	1	3	1	5
TOTAL NUMBER OF FLOCKS	1	..	2	3	8	3	17

The only flock where the lambing percentage dropped below 60 per cent was on a Blackface hirsel which is very exposed

and the vegetation heathery with much bracken and blaeberry interspersed with screes of loose stones which support little or no plant growth at all. This isolated case is, however, offset by one Blackface hirsel in the same parish where the lamb crop exceeded 100 per cent. From the second half of the table Morebattle and Oxnam parishes seem to have been favoured with numerically better lamb crops than Hownam parish.

As is common all over Scotland, ewe stock replacements are home bred, purchases only being made after a very low lambing percentage such as 1947 or if it is the farmer's intention to change over gradually from one hill breed to another, due to special circumstances which are mentioned later. To continue with the female stock first, any ewe lambs in excess of those required for flock maintenance are sold off in the autumn. The remainder, now termed ewe hoggs as they are over six months of age, are in the main wintered at home on the hills in this area. Of the twelve hill farms under review with their seventeen different lots of sheep, only four covering three lots of Cheviots and two lots of Blackface ewe hoggs winter them away from home during the whole winter period. Other two farmers winter their ewe hoggs away for a three weeks' period as the change seems to do them good. However, of the six hill farms which are run in conjunction with other types of farms both inside and outside the survey area, only two winter their ewe hoggs away from home, and of these only one is on the " home " farm. From all the evidence it appears that these Roxburghshire hills are quite capable of maintaining ample growth on the ewe hoggs during their critical first winter of life. Of course, when wintering costs reach the present-day figure of about 30s. per head plus haulage, many hill farmers think twice before making such arrangements. When the tups are on the hill from the end of November onwards the ewe hoggs have to be " breeked " to prevent tupping.

In the case of all but one of these twelve hill farms the ewe hoggs are tupped at $1\frac{1}{2}$ years of age. The isolated case is a farm where twin lambs are fairly common and approximately half of the ewe hoggs are tupped at $1\frac{1}{2}$ years of age and the other half at $2\frac{1}{2}$ years. There seems to be quite a divergence of opinion on the best age at which to draft the ewes out of the hill flock for further breeding and/or fattening on better ground lower down the valleys. Of the nine lots of South Country Cheviots under review, four were drafted at $5\frac{1}{2}$ years (*i.e.* after 4 lamb crops) while the other five were kept on the hills for a further year. Of the eight lots of Blackfaces, only two were drafted out after 4 lamb crops, the other six rearing 5 lamb crops before being drafted out.

The purchase of tups is restricted as much as possible in this area. Some rams have to be bought periodically to introduce fresh blood and to keep in-breeding within limits, but the most common practice locally is to use the one or two purchased tups on some of the best selected ewes, and rear the best tup lambs off them for use with the main part of the flock. Where there is more than one hirsel of one breed on a farm, tups may be transferred from one to another, thus minimising cash outlays. Of the 12 hill farms under consideration only four do no tup breeding at all.

Except in three cases in 1951, all wedder lambs were sold off as store lambs in the autumn of their first year for fattening on arable or semi-arable farms at lower elevations. On two of these three farms the top 100 to 120 lambs (all Blackfaces) are usually graded as fat lambs, while the third farmer keeps about 30 of his smallest wedder lambs over for another year. Even the inducement of the increased wool price in 1951 allied to increasing prices for store sheep has not tempted hill farmers in this area to maintain wedder hirsels in spite of labour scarcity. The probable reason is that reasonably high lambing percentages can be obtained, and the quicker the turnover the better.

The chief market for this area is Hawick, some 25 to 30 miles away. Here store lambs, both ewe and wedder, draft ewes and tups are sold. Tups can also be purchased here in September and October, and, incidentally, this centre stages very important suckled calf sales for hill and upland farmers in mid-October, so it seems to supply all the needs for this type of farming. Some farmers still sell their Blackface draft ewes at Rothbury on the English side of the Border, some 20 miles away as the crow flies, but 40 to 50 miles away by road. In former days the sheep were herded over the Border to this market on foot, but in recent years Hawick has superseded it in importance. One breeder with a Blackface flock markets all his lambs and ewes at Lanark, a well-known recognised Blackface market fully 60 miles to the west.

Since the emphasis of the payment for mutton has been by weight rather than by quality for quite a number of years there has been a gradual change-over from the South Country Cheviot breed to Blackfaces, for many of the lambs can be graded off their mothers at weaning time without extra feeding. This change-over is noticeable on the hill farms of the three parishes surveyed, and while actual statistics for the farms surveyed cannot be produced, it is fair to assume that the rate of change-over will be fairly similar to that for the whole county of Roxburgh for which figures are available. The statistics set out in Table XI. are compiled from Hill

Sheep Subsidy figures for Scotland by counties published in other hill-farming reports. The table shows a comparison between the number of ewes of each breed eligible for the subsidy in 1941 and 1950 and the three Border counties of Roxburgh, Selkirk and Dumfries have been selected as being the home of the South Country Cheviot breed. In actual fact these three counties between them had 46·5 per cent of the total number of Cheviot ewes in Scotland (both North and South Country types) which were eligible for the subsidy in 1941, but this had dropped to 40·2 per cent by 1950.

TABLE XI. VARIATION IN NUMBERS OF EWES ELIGIBLE FOR THE HILL SHEEP SUBSIDY, 1941 AND 1950

	Black-face	Per Cent	Cheviot	Per Cent	Other Breeds	Per Cent	Total	Per Cent
County of Roxburgh—								
No. of Eligible Ewes								
1941 . .	19,123	18·1	86,377	81·9	..	..	105,500	100%
1950 . .	28,410	29·8	66,499	69·9	289	0·3	95,198	100%
County of Selkirk—								
No. of Eligible Ewes								
1941 . .	29,360	45·9	34,631	54·1	..	..	63,991	100%
1950 . .	33,611	52·3	30,439	47·4	194	0·3	64,244	100%
County of Dumfries—								
No. of Eligible Ewes								
1941 . .	70,400	40·9	101,585	59·1	..	..	171,985	100%
1950 . .	82,010	49·1	84,955	50·9	..	..	166,965	100%

These figures show the extent of the transfer of allegiance from the South Country Cheviot breed to the Blackface breed in these three predominantly Cheviot counties: this might have been greater still but for the maintenance of bound stocks of Cheviots. Actually, between 1941 and 1950, there has been a 48·6 per cent increase in the number of eligible Blackface ewes in Roxburghshire, while the corresponding increases for Selkirk and Dumfries are 14·5 per cent and 16·5 per cent. The decreases in the numbers of eligible Cheviot ewes for the same period are: Roxburgh 23·0 per cent, Selkirk 12·1 per cent, and Dumfries 16·4 per cent. The total number of eligible ewes has risen by 0·4 per cent over the nine years in the case of Selkirkshire, but Roxburghshire shows a decrease of 9·8 per cent and Dumfriesshire one of 2·9 per cent.

Some of these hill farmers were further satisfied that with

the extra weight of wool from the Blackface sheep at a lower price per lb. compared with the South Country Cheviot sheep, it paid them better to produce the former wool under the present-day prices guaranteed by the Wool Marketing Board. Whether the pendulum will ever swing back in favour of the Cheviot breed or not depends largely on future marketing plans; hence the need for some long-term price policy.

Cattle

To turn now to the cattle stocks maintained by these twelve hill farms in 1951, eight of them had breeding herds of varying sizes, one had no cattle at all except the shepherd's cow, one kept the offspring of some half-dozen dairy cows, while the other two purchased store cattle, kept them on the hill and sold them off as either fat cattle or good conditioned stores. The numbers of breeding cows in the herds in 1951 varied from 4, due to be increased to 20 the following year, to 85 per farm, while the numbers of store cattle purchased varied from 5 to 40 per farm. The size of herd is governed almost entirely by the availability of winter keep, mainly in the form of straw and hay, there being no correlation between the number of cows and the extent of the hill they have to graze.

The breeds of cattle carried are many and varied, ranging from pure Galloways on the one hand through Blue-Greys (of both Galloway and Aberdeen-Angus crossing), Shorthorn-Highland cross, Irish commercial cows to Hereford crosses. The bulls used comprise Galloway (used on the first mentioned), Aberdeen-Angus (used on the Blue-Greys and the Hereford cross cows), Shorthorn (used on the Highland cross cows) and Hereford (used on the Irish cows).

Female replacements for the herds are usually purchased as bulling heifers, except in the case of a pure-bred Galloway herd where the replacements are home-bred. All these heifers are served for the first time at an age approaching 2½ years, having their calves in the spring of their third year. The bulls, except in the case of the pure-bred herd, can be kept for many years with no fear of in-breeding and new sires are purchased only occasionally.

Complete in-wintering of these hill cows is not carried out as a rule except in the case of a few beasts which happen to be in poor condition, though in severe weather the herd may be kept at night in a half-open court, if such a building exists, and allowed out through the day. Additional feeding, which usually consists of oat straw after the New Year and hay and a few turnips in the last month or so of pregnancy and con-

tinued until the grass comes again in the spring, is normally given on the hill itself in some sheltered spot. A few of these hill farms which are run in conjunction with arable or semi-arable farms winter part of the hill herd at the "home" farm. These "home" farms are also useful in providing winter keep for the breeding herd on the hill farm if the distance between the two units is not too great.

To complete the cycle these cows all calve down in the springtime on the open hills, though heifers having their first calves may be calved on the in-bye land for closer supervision. The calves run with their mothers on the hills until weaning time, which is usually mid-October. These calves have been untouched by human hand except for castration of all male calves, so it can well be imagined how wild they are when they are taken from their dams in October. Of the eight hill farms having breeding herds, only three sell off all their calves as suckled calves—one to St Boswells and the other two to Hawick. Two more transfer all their calves to the "home" farm for feeding, while the other three sell off all their heifer calves at Hawick and retain the bullock calves for further feeding either on the hill farm or on the "home" farm. This supplying of store cattle for the "home" farms is perhaps the chief benefit derived by them from their close linkage with a particular hill farm.

An example may be given of what can be accomplished on these hill farms. One farm in the survey area, possessing more than the average amount on in-bye land, produces and sells home-bred bullocks, which at 2½ years of age command prices at least the equal of fat cattle prices without the animals ever having left the hill farm before the sale. There is no ground on this farm below 800 feet above sea level and only the bullock calves are retained at weaning time. During their first winter these calves are fed on hay, turnips, bruised oats and a little cake in a covered court in which they remain day and night. The following spring, *i.e.* as yearlings, they are returned to the hill until the autumn when they are once again brought indoors, being given straw and turnips during their second winter. The following spring as two-year-olds they graze on first year rotation grass, which in 1952 at least was of first-rate quality and appeared like a veritable oasis in the middle of the desert when one was driving up the valley. These cattle are then sold off in the autumn as very high-grade stores at attractive prices. The secret seems to lie in maintaining the baby flesh on them during the first winter by good feeding allied with the production and utilisation of first-rate grazing during the final six months.

Returning to the breeding herds once more, there is no

definite age at which cows are cast out from the herd. A cow is drafted out when she is considered unfit for breeding or if she has failed to rear or produce a calf for the last two years or so. With the recent increases in the numbers of cows kept on the hills, many farmers are considering working into definite age groups for drafting out old cows and introducing young heifers annually. However, the number of cows kept on each farm is limited by the availability of winter keep, so that unless a hill farm is allied to an arable or semi-arable farm there is not much chance of greatly increasing the stock numbers on the hills.

Of the two farms surveyed which buy in store cattle, one buys yearlings in the spring, runs them on the hills in summer, winters them indoors at night and outside through the day, selling them off fat or as prime stores the following autumn at 2½ years old. The cost of the yearlings is the deciding factor here economically, though of course the improvement to the sward by mixed grazing must be taken into account. Because of lack of shelter this farmer has never started a breeding herd. The other farmer buys in a few Galloway bullocks in the autumn, winters them on straw from the " home " farm—having no tillage on the hill farm—and grades them the following year, *i.e.* after one year's keep.

Statistics dealing with stocking intensity in terms of acreage of rough grazing per cow are rather meaningless because of the dependence of the herds on winter keep, much of which is not even provided by the hill farms themselves in this area. Also the number of acres per cow varies through time until a balance is achieved ; if, for instance, there have been no cattle kept on the hills for a few years, a heavy stocking in the region of 10 to 15 acres per cow can be maintained for a year or two, but as the bulk of the rough grass is cropped fairly bare in that time the number of cows has to be reduced, otherwise winter feed for the sheep will be decreased in quantity with disastrous results. No hard and fast rules can be laid down as to stocking capacities for both sheep and cattle on the hills ; it is simply a case of trial and error, with constant observation of the herbage all the year round by the farmer and/or the shepherd.

There is no uniformity in the composition of the livestock population in the total area surveyed. Indeed, the number of ewes per cow varies from parish to parish and is as follows : Hownam, 27 ewes per cow ; Morebattle and Oxnam, both 57 ewes per cow, but the sample is small and the varying proportions of co-operation with other types of farms seriously affect the results. Actual figures for birth rates of calves in 1951 were not always obtainable, but in most cases it would

approximate to 100 per cent, while deaths were few and far between. Because of the long distances to market it is not always possible for these hills farmers to salvage a casualty beast before it dies.

Much has been written elsewhere about the advantages to the grazing sward of mixed grazing by cattle and sheep ; the experience of local farmers strongly supports this, whilst there is ample evidence of the resulting improvement to be seen. Further, in the parishes of Morebattle and Hownam much of the worst of the bracken is in process of being eradicated by cutting or by bruising as previously mentioned, and the presence of cattle will deter, to a certain extent, the young fronds from regaining the ground they have lost. The chief drawback to cattle on the hills is the damage they do to the open drains by knocking in the sides, necessitating almost annual cleaning. However, the hill farmers in this area are luckier than most, for the comparative dryness of their hills reduces the number of such drains.

Labour

On the twelve farms under review there is a total regular staff of 30 shepherds and 16 other workers, excluding the farmers themselves. This gives the shepherds an average of approximately 400 ewes each to look after. In addition where cattle are also kept it is usually the head shepherd's duty to look after them, although for the bulk of the year this only entails having a look at them on his normal round of the sheep.

Because of the lack of communal life and the almost complete absence of public transport to the centres of population and entertainment, the lives of these hill workers and their wives and families must be very lonely. However, the age when youngsters walked upwards of five miles to school is past, as taxi or bus is now provided in this age of mechanisation. It is only from these same children brought up on the hills that the future supply of hill shepherds will come, because very few town and city dwellers can adapt themselves to the conditions. Housing conditions are now being improved on many hill farms with the introduction of new cottages with electricity, hot and cold water supplies, good roads and bridges (under the Hill Farming and Livestock Rearing Acts), but many a hill farmer and landlord is hard pressed to provide the capital necessary for these schemes.

To balance these disadvantages the hill shepherd is, however, the highest-paid regular worker in Scottish agriculture these days. In addition to his cash wage, usually well above

the minimum, he has his cottage, the keep of a cow or two plus followers, keep of his dogs, some firewood or peat for fuel, sometimes a few pack ewes and often a bonus on sales. Of course, the financial success or otherwise of any hill farm and especially one where the farmer is not in actual residence depends so much on the skill of the shepherd that a good one thoroughly earns the extra remuneration.

While the supply of regular labour is always somewhat precarious in these times, the supply of casual labour is almost non-existent among hill farming in the area surveyed. Whenever there is any cropping, casual labour is needed at haytime, harvest, and turnip singling; while for the sheep stock it is needed for lambing, tailing, clipping and dipping to mention the most important seasonal jobs. There is only one village, Hownam, in the actual survey area, though as the Forestry Commission have now started planting at Phawhope the position may in time become slightly less acute.

Looking at the labour requirements of this hill region, the benefits derived from running hill farms in conjunction with other types of farms—where they are not too far distant—can readily be seen. At special rush periods the farmer can run his available farm staff up to the hill farm in his car or lorry and many hands make light work of any job. This supplying of casual labour to the hill farm whenever wanted is, in the writer's opinion, the most important advantage derived by the hill farm from this co-operation.

III. UPLAND FARMING

Land Utilisation

The thirteen upland farms covered by the survey average in size 870 acres, of which 681 acres or 78·3 per cent can be classified as out-bye or rough grazing, the remaining 189 acres or 21·7 per cent being in-bye land, enclosed and capable of cultivation. In size, the farms range from just below 400 acres to almost 1,400, while the percentage of in-bye land varies from a minimum of 12·4 per cent to a maximum of 59·1 per cent. Thus it will be seen there is great variation within the small sample.

The elevation of the in-bye land varies from 400 to 800 feet above sea level and the actual hills themselves do not rise above 1,200 feet except in one instance. Clearly the ground conditions are much more favourable than in the case of the twelve hill farms described in the foregoing part of this report.

While the bulk of the crops grown on the in-bye land is

consumed on the farm a little is grown for sale, and at these lower elevations it is common to find barley grown as well as oats, but no wheat. Every farm in the sample cultivated some part of the in-bye land and grew oats; of the thirteen, eight also grew barley. The most important green crop grown is turnips and swedes, while a few acres of potatoes, rape and cabbage are also to be found, all being consumed on the place. On the average 33·1 per cent of the in-bye land is under grain and green crop combined, 12·1 per cent is cut for hay and the balance 54·8 per cent is kept for grazing.

Rental Values

The average rental value of the thirteen farms works out at 6s. 3d. per acre, ranging within the extreme limits of 5s. per acre and 10s. 1d. per acre. This average figure is much less than the average of 8s. 4d. per acre quoted in the Department of Agriculture for Scotland's 'Types of Farming in Scotland' * for an average of 321 stock-rearing farms in the South-East of Scotland in 1947. However, the rent of 8s. 4d. per acre relates to a smaller and rather more intensive type of farm 465 acres in extent compared with our 870 acre farm, and the former has a higher proportion of in-bye land—39 per cent as against 21·7 per cent for our own sample of farms. It would thus seem that our sample in the three parishes consists of larger farms than the average to be found in the South-East of Scotland generally, having fully more out-bye land attaching to each farm.

Sheep

The breeds of sheep carried vary greatly even in this small sample of thirteen upland farms. On the actual out-bye land itself are maintained six flocks of South Country Cheviot and three flocks of Blackface sheep, all pure bred. Using a combination of out-bye and in-bye grazing, one finds three flocks of North Country Cheviots bred pure, one flock of North Country Cheviots and one flock of South Country Cheviots, both crossed with Border Leicester tups to produce Half-Bred lambs, and six flocks of Half-Bred or Suffolk Cross ewes, which are usually mated with a Down tup for the production of cross lambs. Only seven of the thirteen farms carry one type of sheep stock only, five carrying two separate flocks each and one even having three different flocks within its single organisation.

* Table 41, page 76.

Because of the wide variations in the proportion of hill and in-bye land it is not possible to calculate stocking intensity in acres per ewe on a comparable basis to the hill farms. At marking time in 1951, adding the flocks on all thirteen farms together, the number of ewes of each breed on hand was Blackfaces 860, South Country Cheviots 3,201, North Country Cheviots 1,548 and Half-Bred and Suffolk Cross 1,299. The percentage lamb crops at the same date in 1951 for the four breeds averaged out at Blackfaces 90·8 per cent, South Country Cheviots 92·5 per cent, North Country Cheviots 123·8 per cent, and Half-Breds and Suffolk Crosses 149·5 per cent. The percentage lamb crops for the two hill breeds, it will be observed, are very similar to those for the twelve hill farms farther up the valleys on more exposed land, as already described. In fairness to the breeds it should be emphasised that the Half-Bred and Suffolk Cross ewes will be rarely, if ever, out on the out-bye land, being maintained almost wholly off the in-bye land, but the North Country Cheviots are often to be seen on out-bye land at these altitudes.

Female stock replacements for the pure breeds are, of course, home bred, but where crossing is carried out ewe hoggs or gimmers have to be purchased unless the farm also carries a pure-bred flock of the same breed of ewe. In every case, gimmers, no matter what their breed, are first served at 1½ years of age, but the drafting-out age varies according to breed. Half-Bred and Suffolk Cross ewes are cast as 3-crop ewes, *i.e.* at 4½ years of age in three cases, as 4-crop ewes in one case, and as 6½ year-olds in the other two instances. North Country Cheviots are drafted out as 6½ year-olds in three cases and as 5½ year-olds in the other, while the Blackfaces and South Country Cheviots also vary between 5½ and 6½ years of age.

The majority of the ewe hoggs are wintered at home either on the grass and turnips of the in-bye land or on the hill in the case of the hill breeds, the ewe hoggs from only three flocks being actually wintered away from the upland farms. In the case of the Half-Bred and Suffolk Cross ewes, these are usually purchased as gimmers, full grown on arrival, and no problem of wintering away arises.

Very few of these upland farmers feed their own lambs off the in-bye land, preferring to sell them through the store market. As in the case of the hill farmers, Hawick is the chief marketing centre, though a few lambs, notably the cross lambs, are despatched to St Boswells market. In one case where the upland farm is run in conjunction with an arable farm outside the survey area, the bulk of the store lambs and even the draft ewes are transferred to the " home " farm for

finishing. The markets most used for the draft ewes are Hawick, St Boswells and Rothbury. Only one farmer retained a few wedder lambs to run on the hill for a further year more as an experiment than anything else, but the common practice is to get rid of all wedder lambs and surplus ewe lambs in their first year. Very few tups are bred on these upland farms, the majority being purchased at Hawick when required.

Cattle

Every one of the thirteen farms surveyed has a herd of breeding cows, one farmer even having a separate out-bye herd and an in-bye herd. Eleven of the fourteen herds vary in size between eight and twenty-two cows; another herd, the largest of all, has thirty cows; the other two herds, though small, are supplemented by the presence of store cattle in varying numbers.

The breeds concerned vary from pure Galloways, through Aberdeen-Angus crosses, Blue-Greys to Shorthorn cross cows, while the bulls used range from Galloway, Shorthorn, Aberdeen-Angus to Hereford, the most common cross being a Blue-Grey cow mated to an Aberdeen-Angus bull. Only in the case of the pure-bred Galloway herd are female replacements home-bred, all the others being purchased as heifers and served for the first time at approximately 2½ years of age. As in the case of the cattle on the hill farms before-mentioned there is no definite drafting-out age for old cows. Calving rates once again approach the 100 per cent mark and the death rate is not heavy.

Regarding the wintering of the breeding herd, three of the herds are out-wintered, five of them are in-wintered in byres or courts, and the remainder run out through the day and are brought in every night. With a large area of in-bye grazing land available, usually enclosed by dykes, it is quite common practice on upland farms to run the cows in semi-open courts or some lean-to shed whereby the cows can go out and in at will, day or night. As in the case of the hill farms the bull is usually kept over the winter in a court or tied up in the byre with the leanest cow for company. The feeding sequence is similar to that already mentioned for hill cattle, comprising straw, hay, turnips and possibly a little bruised oats, all home grown. Calving takes place about March month, either in the courts or on the in-bye land, except perhaps where there is a large amount of Galloway blood in the cows, when it may take place on the open hills.

On upland farms the calves, especially if born on the in-bye land or in the courts, will be handled more frequently than in

the case of the hill calves born on the hills ; hence at weaning time in mid-October they are slightly more tractable. Six of the fourteen herds sold off all their calves at this stage at St Boswells, another one sold at Hawick a week later, one sold the heifer calves at Hawick transferring the bullock calves to the " home " farm, while the remainder retained their calves. Of the latter group, two farmers sold the calves off as yearlings after in-wintering them on hay, turnips and bruised oats, but the remainder kept them until they were fat and ready for grading. The limiting factor to increasing the number of cattle retained on these upland farms seems to be the lack of suitable buildings rather than the availability of winter keep. The calves must be kept indoors and well done to in their first winter if a success is to be made of feeding them, and the breeding herd—unless of Galloway or Highland blood or some cross thereof—must have some shelter in winter.

The proportion of breeding cows to ewes is much higher on the upland farms in Morebattle and Hownam parishes, but less in Oxnam parish compared with the hill farms. On the upland farms surveyed in Morebattle parish, there are 31 ewes to every cow as against 78 in the hill farms ; in Hownam parish the ratio is 25 ewes per cow on the upland farms against 34 on the hill farms, while in Oxnam parish there were 68 ewes per cow on the upland farms compared with 50 on the hill farms. This contrast furnished by the upland farms in Oxnam parish is probably due to the fact that a greater proportion of the in-bye land is utilised for cash crops than is the case in the other two parishes.

Labour

The total regular labour staff on the 13 upland farms (excluding the farmers themselves) consists of 15 shepherds plus 28 other workers mainly concerned with the cropping side of the farm business. On the average each shepherd has 460 ewes to look after, in addition to the work he undertakes for the cattle stocks on the hills. The workers concerned with the in-bye cultivations, &c., comprise 11 tractormen, 2 horsemen, 2 cattlemen and 13 orramen. This gives 28 men to cultivate 2,454 acres of in-bye land, of which 33·1 per cent is in crop, 12·1 per cent under hay and the balance, 54·8 per cent, under grass. Working on a " per-head basis," the average worker handles 29 acres of crop, 10½ acres of hay and 48½ acres of grass, *i.e.* 88 acres per man.

Once again casual labour is noticeable by its absence, though in the sample of 13 farms there are nine which are

run in conjunction with other farms in and outside the survey area. This co-operation and transfer of workers from one farm to another greatly alleviates the labour position, which would otherwise be really serious for these upland farmers with their crops to attend to.

IV. HILL AND UPLAND FARMING—OTHER IMPORTANT FACTORS

Having dealt separately and in some detail with the main features of hill and upland farming because of the differences between them, the two groups may now be dealt with together whilst certain other factors common to both are considered. These chiefly affect the nature of the actual rough grazings themselves, factors affecting their productivity, while such points as fencing, tenure, the state of the farmhouses, cottages and steadings also deserve mention.

A few general impressions of the herbage of the out-bye land may be permitted, although, of course, anything savouring of a botanical survey would be completely uncalled for; in any case such a survey of the area has already been carried out by the Advisory Botanist and his staff.

The hills are in the main grassy hills with heather, which predominates in a few areas, chiefly to be found on the higher slopes. Very few of the upland farms surveyed had much heather at all, while very few of the hill farms surveyed were completely devoid of it. Great variations were to be found in the quality of the grazing, even within the bounds of one farm. It is fairly common to find the best herbage nearest the steading, possibly due to liming and manuring, aided by the fact that the cattle probably fed there during winter. As one wanders away from the steading the quality of the grazing deteriorates and some poorer grasses and even patches of blaeberry are to be found, while up on the English border peat banks are common, the ground tending to be boggy even in summer. That scourge of hill land, the bracken, is to be found in abundance all over the area especially on the better hill land, though very little of it has reached the stage at which all other vegetation is completely smothered out.

Control of the grazing sward is carried out mainly by the mixed grazing of cattle and sheep, and even the bulk of the heather in this area can be kept under control by the grazing of sheep. Here the Blackface breed seems to be more suitable than the Cheviot breed. Where the heather is strong-growing it is usually burned in rotation.

Bracken on the other hand, which, up to the present, can only be eradicated by cutting or bruising at certain definite stages of growth, grows on some very inaccessible land where no tractor can travel with safety, hence it is impossible to rid all the hill land of this menace. It seems to thrive on the best areas of the hills, though some farmers insist that it is not spreading. If this is correct, soil conditions may be an important limiting factor to its increase. Until some spray is invented which is lethal to bracken and which can be applied by helicopter or similar means, the writer is of the opinion that the majority of the hill and upland farmers will have to continue using the scythe or some machine to keep the bracken from overrunning all the hills and thereby lowering output. The Bracken Eradication Experiment being run in Bowmont and Kale valleys for the past two years was mentioned in the introduction. Here, by 1952, records show that 434 acres have been cut or bruised four times in two years, while a further 102 acres have been similarly dealt with twice during one year. When this experiment is completed the grazing capacity of these acres should be improved and, if required, would then appear to be ready for further improvements such as liming and manuring.

Before any real improvement can be effected by the use of lime, phosphates and grass and clover seeds it is almost imperative to tease up or cut up the mat of dead vegetation, which in some areas reaches a depth of almost six inches, before the nutrients and the seeds can reach the actual soil. This can be done by heavy harrows hauled by a tractor, but the heavy Cuthbertson bracken crusher pulled by a caterpillar tractor, after going over an area of bracken-infested country some five or six times in three years, seems to have a similar effect on the land. The application of lime and phosphates on top of the mat has, however, a beneficial effect on the existing grasses. Indeed, one farmer who applied fairly heavy dressings of lime on a part of the hill nearest the steading one year found the result so encouraging that nowadays he has to drive the sheep and cattle off that area to make them graze the distant areas of the hill at all.

One of the points which strikes the observer most on walking over the hills in this area is the almost complete lack of shelter belts on the hills themselves. In point of fact, eighteen out of the twenty-five farms surveyed have no shelter belts on the hills at all, a few having an old one near the steading. Some of the old shelter belts are in the process of being cut down and a few replacements have been planted as parts of comprehensive improvement schemes under the Hill Farming and Livestock Rearing Acts within the last five years. By the

look of things few, if any, have been planted within the previous twenty years to that, but with the presence of the Forestry Commission at Phawhope in the south of Oxnam parish, there may be some co-operation with hill and upland farming in the planting and maintenance of shelter belts, even if they are but small areas of, say, 5 to 10 acres in size. Besides giving shelter to cattle and sheep, it is claimed that the planting of trees stabilises the water level, which in this dry and bracken-infested countryside could prove quite beneficial.

On the question of drainage much work has been done in recent years by the Cuthbertson drainer on the hills in this area. The open drains become more liable to damage at the present time than in former years because of the increase in the numbers of cattle on the hills. Some of the upland farms have very few open hill drains because of their natural drainage. Cleaning out the worst patches has to be carried out almost every year by the workers, but on the whole it is safe to say that the hills in the area surveyed are well drained.

Fences, both march and internal, and dykes are as a general rule in good order. The area is well enclosed, there being very few open marches between farms or even between adjoining hirsels on the same farm. It says much for the craftsmanship of the old drystone dykers of the last century that many miles of their handiwork are still in good order at the present day. Improvements are being made to stells and bughts on the hills, and side roads and bridges to outlying shepherds' cottages are being renovated under Hill Farming Act schemes here and there. The main roads and the short side roads to the farm steadings are in every case passable for wheeled traffic, but beyond that, it is often safer to walk. Because of the unavoidable lay-out of the bulk of these farms with their steadings situated in the corner of the farm nearest the main road, long distances have to be travelled to cover the whole area. Even to walk round the march fence would occupy a full day or more on many of the hill farms.

The steadings and farmhouses are mainly of rather ancient vintage, only nine of the latter being occupied by the farmers themselves, the remainder being utilised as cottages for the workers. On the hill farms the steadings are small, usually consisting of a hay shed, a small byre and a small stable, while on the upland farms there is usually an implement shed, an open or semi-open cattle court and a turnip shed as well as a slightly larger byre, stable and hayshed. A few have a power-house with an engine to provide electricity for the steading, farmhouse and cottages, but in many, paraffin lamps and calor-gas heaters are still used. Many of the farmhouses and the steadings are too old to be worth while spending

much capital on, and it would certainly require very heavy outlays to bring them up-to-date and make them suitable for their original purpose. Where the cottages are concerned, it is a different story, for many renovations and improvements have been carried out. And under the Hill Farming and Livestock Rearing Acts new cottages have been built recently with electricity, hot and cold water and every convenience laid on to make the lot of the worker more pleasant.

As to tenure, on the twenty-five individual units surveyed, nine hill farms and eleven upland farms are in the hands of the tenants, the remainder being in the hands of the landlord, though there are no cases of resident owner-occupiers. Actually, there are only seven landlords in all and not one lives on any farm he owns. Leases seem to vary between year to year, 10 years and 14 years, while some tenants were very vague about the particulars of their leases. More than one farm had been tenanted by members of the same family for upwards of 300 years.

V. ECONOMIC ADVANTAGES OF MULTIPLE-FARM BUSINESSES

It is a very common practice in the south-east of Scotland for a farmer to run a hill and/or upland farm in close co-operation with an arable or semi-arable farm, and the advantages to all types of farming concerned are many and far outweigh the disadvantages. Normally the farmer is resident on the arable or semi-arable farm of which he is often the owner, while he is usually the tenant of the hill or upland farm. This combination of enterprises became very popular in the late war and early post-war years when many hill and upland farmers relinquished their tenancies after many years of eating into their capital resources. The arable farmers during this period of fixed prices were doing well financially and seized the opportunity of taking over the tenancies of hill and upland farms thereby reducing for a while their liability to pay large sums of money away in Income Tax and Sur-tax. Having the necessary capital they could invest large sums in the hill and upland farms where it was badly needed.

As to the main advantages to the hill and upland farms the readily available supply of casual labour from the " home " farm has already been mentioned. Hay and straw and other feeding may be brought up from the " home " farm if not too far distant whenever the supply of home-produced food is

insufficient on the hill and upland farm, thus resulting in increased fertility. Marketing problems of both sheep and cattle are much reduced where the majority of the store stock and draft ewes are transferred to the " home " farm. Wintering of ewe hoggs and breeding cows can be carried out on the " home " farm, thus saving the winter keep for the rest of the sheep stock.

On the other hand the advantages to the arable farm result mainly from the supply of store sheep and cattle of known quality at the bare cost of production, thereby eliminating auctioneer's commission and middleman's profit. The risk of the introduction of disease is also reduced, which in these days of epidemics of foot-and-mouth disease is quite an important point.

The main disadvantage which comes to mind concerns the inability of the farmer to be in two places at once, though quite often he is in telephonic communication daily with the shepherd on the hill and upland farm even though he may only visit him once a week. It is a well-known fact that by personal supervision or, better still, personal participation in the day-to-day manual work any farmer gets the optimum output from his labour staff.

Furthermore, it is of course true that, unless careful records of inter-farm transfers and transactions are made, the merging of two or more previously independent and possibly complementary farming units into one complex farm business may easily obscure the financial results of each individual unit therein. Once merged, each farm so easily loses its identity ; but if it is considered desirable to continue to keep separate accounts for each farm, this can be readily arranged, and no disadvantage then ensues.

In contrast to the multiple-farm business we have the single unit farmed by either a tenant or owner-occupier. Generally speaking, for some years past the hill and upland farmer has at best, either just been making a fair living or compelled to dip into his limited capital resources, unless prepared to take off his jacket and do a full day's work along with the men. Selling all his produce except wool on the open market (since store cattle and store sheep are not subject to the Annual Price Review negotiations) he often finds himself at the mercy of the buyer especially if, as is usual, the farm is some distance away from the market. Suppose, for example, the selling price of his stock does not quite reach the seller's expectations, will it pay him to withdraw his beasts from the sale ring, take them home again and try again later on ? The answer to that question is " Not very often, if at all " ; hence, a farmer who is unable to finish off

his stock and thus be eligible for a guaranteed price for it, is at a disadvantage. With all his capital tied up in his farm he is continuously worried about making ends meet and keeping his head above water, often working with a large bank overdraft.

When one looks at the amount of capital expended on implements to cultivate successfully the in-bye land of these hill and upland farms, the single-unit farmer is again at a disadvantage. With the short growing season every suitable day for doing each operation is valuable, and unless he has the implements and power on hand, delay may be fatal; hence he is more or less compelled to purchase, even though this involves very heavy capitalisation per acre of crop grown, because when hiring he just has to take the use of the implement when it happens to be available. The multiple-unit farmer on the other hand can transfer the implements from the " home " farm when, because of the climate, every single day is not so important as on the hill or upland farm for doing each individual operation. With the relatively small acreages of crop on these hill and upland farms it is not economical to have the full set of implements lying idle much of the time.

With grants for improvement schemes under the Hill Farming Act and the Livestock Rearing Act being continued up to 1956, it looks as if very few of these single-unit hill and upland farmers will have the necessary capital to take full advantage of the provisions, even if they wish to. However, the case of the multiple-business farmer is very different indeed, as supplies of capital while not unlimited do not cause him the same worry with his guaranteed prices for all his crops, fat livestock and wool. The landlords on the other hand with increased repair and maintenance charges on their property and with little or no increases in their sources of revenue are in a similar position to the single-unit farmers unless they have readily available sources of private income.

VI. CONCLUSION

Until a sample of financial accounts of both types of farms in this survey area have been collected and studied over a number of years, it would be wise to reserve judgment on the economic possibilities of the area until later. However, from the factual data collected and from interviews with the farmers and shepherds concerned and from walks over much of the area the writer may venture to give his own impartial opinion of hill and upland farming in the area.

The area covered by the survey includes some of the best hill grazings in Scotland, having an average stocking intensity of 2·0 acres of rough grazing per ewe for the 12 hill farms in conjunction with many cattle. Of recent years these grazings must have been greatly improved in value by the increase in the number of cattle maintained. At the height of the summer growth on the few areas where cattle are absent, these grassy slopes become dotted with clumps of bent which are more or less untouched by sheep. The recent Bracken Eradication Trials initiated in 1951 in Bowmont and Kale valleys (which it is hoped will be carried on for a year or two yet) have also helped to improve the grazings both by the reduction of the bracken and by the cutting down of the clumps of bent when a cutting type of machine is used. It is a pity, however, that these machines can only be utilised on the more accessible land, as there are large areas where bracken and bent thrive on which no machine could travel with safety.

The almost complete absence of shelter belts on the hills strikes the observer very markedly on traversing this area. The introduction of a few of these even of 5 to 10 acres in extent would increase the carrying capacity of the hill and upland farms and thus increase the output per farm. They would also retain much of the water in the soil, which in this comparatively dry area would help to prevent burning of the pasture in a dry summer. This area consists of pasture too good and valuable to be taken over in large-scale units by the Forestry Commission, but the possibilities of local co-operation as envisaged in Oxnam should be welcomed by farmers. Advice will be given willingly by members of the Commission to hill and upland farmers seeking it.

A few farmers have been putting lime and phosphates on the hill ground in recent years with encouraging results. Much more of this type of improvement could be carried out, especially on those areas where the bracken is in process of being eliminated within another year or two. The increased value of the grazing sward would tend to increase the stock-carrying capacity of these areas and the increased crushing of the young fronds of bracken by cattle hooves would help to keep that menace in check for a longer period.

The farmers and others interested may perhaps feel that it is easy to write in this vein, but as they know only too well, heavy outlay of capital would be necessary for these improvements, and here is the crux of the whole situation. For many years now, even with the aid of government subsidies, many hill and upland farmers even in this area have been unable to lay away sufficient capital to finance any large improvement schemes even when, under the Hill Farming Act of

1946 and the Livestock Rearing Act of 1951, Government grants of 50 per cent are given to encourage them. However, there are a few farmers in the survey area farming either single units or multiple businesses who have found the necessary capital and gone ahead with such improvement schemes under the Acts, and, in course of time, they should reap the benefits in increased output and a satisfied labour supply. Perhaps too small a proportion of the money spent on improvements is utilised on the land itself and too much on farmhouses, cottages and steadings. While such improvements are important for the purpose of maintaining or increasing the labour supply, it is only by the improvement of the land itself that the beef and mutton production of the country will be increased and a saving of imports result. These comprehensive improvement schemes under the Acts are long-term policies and it is up to all hill and upland farmers, whether tenants or landlords, to take full advantage of them if at all possible.

Nor is the labour position of these hill and upland farmers at all reassuring. If young shepherds are not attracted to our hills in the near future the position will become precarious ; many farms will become unworkable, and the land will be lost forever to sheep and cattle rearing. Something must be done to improve the communal and social amenities of these outlying districts. In the area surveyed the lack of public transport up Bowmont valley and the limited nature of the bus services in the other two valleys have a disastrous effect on the recruitment of labour, both regular and casual. The hill farms need casual labour at lambing, clipping, dipping and at harvest and hay times, but the upland farmers with their greater acreages of crops suffer from an even greater dearth of casual labour than occurs higher up the valleys. In one of the parishes surveyed, Oxnam, the activities of the Forestry Commission should result in an improvement in the casual labour position there eventually and may lead to improvement of the social amenities of the area.

The benefits derived from the multiple-farm type of business have been mentioned in the previous section, and this practice, already common in the south of Scotland, will probably increase rather than decrease because of the capital resources required at the present time to take over a hill or upland farm. This would be to the benefit of both upland farming (which has had an uphill struggle for a long time) and, to a large extent, of hill farming as well, though it must be admitted that certain single-unit hill farms within the survey area which are well managed and backed by adequate capital are making substantial contributions to the national effort to

increase supplies of home-produced beef and mutton. When one sees what can be done by the improvement of out-bye land, whereby cattle can even be fattened without leaving the farm, it gives one visions of the potentialities of the land in this area if well managed and well supplied with capital. However, for a long time to come, the main purpose of farming in this and similar areas will remain the production of store cattle and sheep for finishing off on lower-lying arable or semi-arable farms.

VII. SUMMARY

(1) The area covered by this economic survey relating to the 1951 crop year comprises hill and upland farms occupying most of the higher ground in the three parishes of Morebattle, Hownam and Oxnam, which lie to the south of Kelso in Roxburghshire running up into the Cheviot Hills. A total of 12 hill farms and 13 upland or stock-rearing farms were surveyed, but of these only 6 hill farms and 4 upland farms are managed as single units, the remainder being parts of multiple-farm businesses consisting of two, three or even four farms each. In all, there were 18 farm businesses wholly or partly included in the 25 farms surveyed. The farms actually surveyed covered practically three-fifths of the total agricultural area of the three parishes mentioned, occupying about one-fifth of the in-bye land and three-fourths of the out-bye land. They carried approximately three-fifths of the total number of ewes in these parishes on 4th June 1951, and two-fifths of the number of breeding cows (beef types only), whilst employing about one-third of the regular labour force.

(2) From statistics covering the whole of the three parishes, and collected at ten-yearly intervals, the changes which have taken place since 1921 can be noted. The increase in the area under grass, with the consequent reduction in cropping by 1931, was allied to an increase in sheep and cattle numbers. The reversal of this process by 1941 with its war-time cropping targets and the change-over from permanent grass to rotation grassland by 1951 after the increased crop production of the war years can also be seen. Cattle numbers have increased greatly—especially beef cattle between 1941 and 1951—but there has been a large reduction in the labour staffs both regular and casual since 1921.

(3) The average size of the 12 hill farms surveyed is 2,045 acres, of which 1,971 acres or 96·4 per cent comprises rough grazing (or out-bye land) and 74 acres or 3·6 per cent in-bye land, enclosed and capable of cultivation. No hill farm

possesses more than 7·8 per cent of its total acreage as in-bye land, the minimum being 1·6 per cent. The 13 upland farms on the other hand average 870 acres in extent, of which 681 acres or 78·3 per cent can be classified as out-bye land and 189 acres or 21·7 per cent as in-bye land. The percentage in-bye land in this group varies from 10·3 per cent to 59·1 per cent of the total farm areas.

(4) The crops grown on both types of farms surveyed are fairly similar and are grown primarily for home consumption. They consist of oats, with some barley also grown on the upland farms but not on the hill farms, turnips, swedes, rape, kale, potatoes and hay (both rotation and permanent). On five of the hill farms there is no arable cropping at all, only the hay crop being harvested.

(5) The rental values of the hill farms range from 1s. 8d. to 5s. 7d. per acre, averaging 3s. per acre, while for the upland farms the range is from 5s. per acre to 10s. 1d. per acre, averaging 6s. 3d. per acre. The bulk of the hill farms lie at elevations of 600 feet to 2,000 feet above sea level and the upland farms from 400 feet to 1,200 feet above sea level. The hills, however, are fairly dry in summer time, having an annual rainfall of just over 30 inches per annum.

(6) On the hill farms the sheep stocks consist wholly of the South Country Cheviot and Blackface breeds kept pure while on the upland farms these two breeds plus the North Country Cheviot are kept pure or crossed with the Border Leicester tup. In addition, flocks of Half-Bred and Suffolk cross ewes are kept mainly on the in-bye land, crossed with a Down tup to produce cross lambs. Because of the weather, 1951 lamb crops were low in many parts of the country, but this area seems to have escaped quite lightly. Lambing percentages for the breeds for both types of farms averaged out at Blackfaces 88·3 per cent, South Country Cheviots 92·5 per cent, North Country Cheviots 123·8 per cent and Half-Bred and Suffolk crosses 149·5 per cent.

The methods of management for each breed are fairly similar; lambs are born in spring, all wedder lambs and surplus ewe lambs are sold off at Hawick, ewe hoggs are wintered mostly at home, first tupped at 1½ years of age as gimmers and sold at Hawick usually as draft ewes at 5½ or 6½ years of age. Half-Breds and Suffolk cross ewes are bought in as gimmers, tupped at 1½ years of age and drafted out after rearing 3 or 4 crops of lambs.

In recent years there has been a quite pronounced change-over from South Country Cheviot sheep to Blackfaces, not only in the survey area but all over the counties of Roxburgh, Selkirk and Dumfries. This is due to the payment by weight

system for fat lambs which has been in force since the early war years. Blackface lambs can in this area be graded off their mothers at weaning time.

(7) The most popular breed of beef cattle kept on these hills is the Blue-Grey cow, which is crossed with the Aberdeen-Angus bull. Besides bulls of the Aberdeen-Angus breed, sires of the Galloway, Beef Shorthorn and Hereford breeds are mated to Galloway, Shorthorn, Aberdeen-Angus and Hereford cross cows. The cows are normally purchased as bulling heifers, first mated at about 2½ years of age, out-wintered at home on the hill or in-bye land, calve down in spring and run on the out-bye land. The calves are weaned in mid-October for sale as suckled calves at St Boswells and Hawick, though a few bullock calves are retained on some farms, in-wintered in courts on hay and turnips, to be sold as yearlings or to be kept in some cases until being sold at 2½ years of age in fat or prime store condition.

(8) Excluding the farmers, the total regular labour staff on the 25 farms consists of 45 shepherds and 40 other workers, chiefly orramen and tractormen. This gives each hill shepherd an average of 400 ewes plus the cattle to look after, while the upland shepherd's flock averages 460 ewes in size. Casual labour on which both types of farms largely depend is almost unobtainable in the open market in such isolated areas, but the labour position is greatly alleviated in the case of the multiple-farm businesses by the transfer of workers from the "home" farm to the hill and upland farms when required.

(9) The rough grazing or out-bye land of the area surveyed is mainly grassy in nature, interspersed here and there with heather, with blaeberry making an appearance on the poorest slopes. The grasses are kept fairly well under control by means of mixed grazing with cattle and sheep, while the heather only requires burning in small areas, the remainder being controlled by the sheep. Bracken is very persistent all over the area, growing strongly on all the best land, but every now and again it is attacked with vigour on some farms and kept in subjection. An experiment, financed by the Agricultural Research Council and operated by the Scottish Machinery Testing Station, working in collaboration with the College, whereby four different machines are being tried out over a number of years under hill conditions, has been in operation in Bowmont and Kale valleys during 1951 and 1952 and is certainly cleaning up the bracken on accessible land, but unfortunately much of the hill land is inaccessible by tractor.

(10) On the whole the hills are well drained, much work having been done in the area in the post-war years by means

of the Cuthbertson hill drainer. Some of the flattish land on the tops of some of the hills near the peat banks is boggy and difficult if not impossible to drain, while some of the lower slopes are drained naturally by the fall of the land. To be really effective, the open hill drains need constant supervision and cleaning out if cattle are kept on the hills, as they are very liable to force in the sides with their hooves.

Shelter belts are noticeable by their almost complete absence on the hills in this area, but with the recent planting of trees by the Forestry Commission at Phawhope in the southern tip of Oxnam parish, it is hoped that small 5 to 10 acre shelter belts will be seen in the near future on these hills, because of their benefits to the livestock especially in winter.

Dykes and fences, both march and internal, are in good order on the whole, while stells, bughts, &c., are in fair order, though many have been repaired as part of improvement schemes under the Hill Farming and Livestock Rearing Acts. Since the passing of these Acts many new cottages and hay-sheds have appeared and improvements to buildings, roads and bridges have been carried out, but many of the steadings are small and old and rather too far gone for economic repair. Some of the farmhouses, too, are very old and damp and costly to repair.

(11) As regards tenure only five farms were in the owner's hands in 1951 but there were no cases of resident owner-occupiers. The remaining twenty farms are all tenanted and of these only nine have the tenant in actual occupation of the farmhouse. Some of the farms are leased for either 10 or 14 years; others are on tacit relocation from year to year; many of the farms have been in the hands of the same family for a period of 300 years.

(12) The benefits to hill and upland farming when land is in the hands of multiple-farm businesses far outweigh the disadvantages, not to mention the advantages to the "home" farm which in the area surveyed is usually within 10 miles of the hill and upland farm. The readily available supply of casual labour from the "home" farm is the chief benefit to the hill and upland farm followed by the supply of winter feed if insufficient can be grown. Wintering facilities on the "home" farm for ewe hoggs and breeding cows are there if desired and by the transfer of store cattle and sheep to the "home" farm for finishing off the uncertainty of the open market, auctioneer's and dealer's charges are dispensed with. The main disadvantage to the hill and upland farm is the absence of the farmer himself, except for periodic visits and telephone conversations with the shepherd who usually acts

as manager in his absence ; farming by " remote control " is seldom completely satisfactory.

(13) The crying need of hill and upland farms in this as well as in other areas is for liberal injections of capital to improve the quality of the grazings by liming and manuring, reseeding, the eradication of bracken, draining, and the planting of shelter belts, &c. Only by these means will it really be possible to increase the output of livestock from the hills. These improvements, besides alterations to the farmhouse, cottage and steading, and the making of new roads and bridges are all eligible for 50 per cent grants under the Hill Farming and Livestock Rearing Acts, and although some farmers have taken the chance to improve their farms, probably much more could be done by others, whether tenants or landlords, if the capital is available.

The salvation of hill and upland farming in the south of Scotland at least lies in the more complete co-operation with arable and semi-arable farms in the vicinity. An increase in the number of multiple-farm businesses similar to those already in operation would provide the capital necessary to improve the hill grazings where deficiencies of lime and phosphates make it imperative that these must be put right as soon as possible. The hill or upland farmer operating a single unit, selling all his store stock on the open market, has generally been placed at a disadvantage since the start of the last war compared with the arable farmer, favoured by fixed prices and a remunerative level of profits. Hence if more capital is to be used to reinvigorate the hills, it appears to the writer that it must, in the main, come from farms lower down the valleys, which, both physically and economically, are more favourably situated. Full use of these 50 per cent grants available under the two Acts should also be taken while the opportunity exists ; after 1956 it may never again present itself.

ACKNOWLEDGMENT

Grateful acknowledgment is hereby made of the valuable assistance and co-operation given by farmers and shepherds of the farms surveyed. Thanks are due also to the Department of Agriculture for Scotland (Statistics Branch) for furnishing the parish statistics quoted and to their Lands Department for kindly undertaking the preparation of the maps included herein. A copy of this interim report will be sent to each farmer who co-operated, and to others interested.

Printed by William Blackwood & Sons Ltd., Edinburgh