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ADVISORY WORK ON FARM MANAGEMENT

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DURING the last ten years there has been a steady and consistent drop in the general index number of all agricultural prices in the United Kingdom (table 1).

The influence of these falling prices is to be seen in the published estimates of the Ministry of Agriculture of the monetary

Table 1. General Index Number of all Agricultural Prices in the United Kingdom, 1920-1930
(1911-1913 = 100)

Year	*Index number of all agricultural prices*
1920	292
1921	219
1922	169
1923	157
1924	161
1925	159
1926	151
1927	144
1928	145
1929	131

values of the agricultural produce sold, or produced for sale, from the farms of Great Britain during recent years. These estimates for the agricultural years 1924-25 to 1927-28 are as follows:

1924-25 ..... £286.2 million
1925-26 ..... £270.2 million
1926-27 ..... £255.8 million
1927-28 ..... £266.2 million

It has been interesting, during this period of falling prices, to follow the yearly variations in the monetary values of the agricultural output, or production, on the farms whose accounts we have had under investigation, and to which we have extended our advisory service (table 2).

It will be seen that the rapid fall in agricultural prices from 1920-1922 gave the farming community very little opportunity of readjusting their methods in time to meet the emergency but that

Table 2. Output Per 100 Acres on Yorkshire Farms, 1921-22 to 1929-30*

Year	Output per 100 acres
1921–22	£1,048
1922–23	744
1923–24	786
1924–25	824
1925–26	774
1926–27	780
1927–28	721
1928–29	779
1929–30	806

* Farms whose accounts are under investigation at the University of Leeds.

since then, to a very great extent, they have risen to the occasion and that from 1923 onwards, in spite of further drops in agricultural prices, the actual monetary value of the agricultural output on the acreage basis has not only been well maintained, but made to rise rather than to fall.

During the war, and up to 1920, on a rising market, the selling price of agricultural products as a whole, rose more sharply than did production costs on the farm, or even the cost of living.

Since 1920, on a falling market, there has been a corresponding lag, and the selling price of agricultural products as a whole has fallen more rapidly than the production costs on the farm, or the actual cost of living, and possibly there never was a time when the farmer was able to buy so little with what he receives in return for the produce which he has to sell.

This point is brought out quite strongly by Mr. R. J. Thompson who gives the index figures for agricultural prices and production costs for the four years, 1925-1929, shown in table 3.

Table 3. Index Numbers of Agricultural Prices and of Production Costs, 1925-1929*

Year	Agricultural prices	Production costs
1925–26	159	156
1926–27	151	148
1927–28	144	153
1928–29	147	157

* Index numbers as given by Mr. R. J. Thompson.

These figures, he points out, correspond with the prevailing view that it is since 1927 that the agricultural depression has been most acute.

Our own records show that over a series of eight years on the holdings whose accounts we have had under investigation, production costs of the farms as a whole, when ranged in their order of magnitude, have been as given in table 4.

From the point of view of the farmer it is, to say the least, unfortunate that his most important production cost—the labour bill— and the third in the order of magnitude—the cost of upkeep of implements and tradesmen's bills—two items which together

Table 4. Production Costs on Yorkshire Farms*
(Based on data covering an eight-year period)

Item	*Cost per 100 acres*	*Per cent of total*
Labour costs	£250	32.2
Purchased foods	187	24.0
Upkeep of implements and tradesmen's bills	120	15.5
Rent	116	15.0
Purchased fertilizers	46	5.9
Purchased seed	34	4.4
Rates	24	3.0
Total	£777	100.0

* Farms whose accounts are under investigation at the University of Leeds.

have been responsible for 48 per cent of the total cost of running the farm, should both be standing in 1930 at a figure at least 100 per cent higher than in pre-war days, while the agricultural products, which the labour employed directly or indirectly is helping to produce, should be selling at prices only 44 per cent above pre-war.

Under the circumstances, unless drastic alterations were being made in the methods and systems of farm management, one would certainly expect that the economic position of the farming community would be steadily going from bad to worse, and the figures as given by the advisory economist for the Bristol Province apparently give support to this supposition (table 5).[1]

[1] Proceedings of the Agr. Econ. Soc 1929, p. 76.

When, however, we examine the results of our own investigations in Yorkshire the trend has been entirely in the opposite direction and the general economic position of the farms as a whole

Table 5. Variations in the Economic Position of Farms in Somerset, 1925-26 to 1927-28

Year	Number of farms	Number of farms making losses	Total loss made	Loss per farm	Loss as per cent of capital
1925–26.....	103	55	£2,453	£23.9	0.48
1926–27.....	89	54	14,284	160.5	3.08
1927–28.....	66	36	10,849	164.4	3.59

has been found to show signs of improvement rather than of going back (table 6).

This, in our opinion, has been due in no small extent to the influence of two factors, (a) the adaptability of the farmers themselves; and (b) the efficiency of our advisory service. This is shown quite clearly by the yearly variations in the *type* as well as the monetary value of the agricultural output. There has been a gradual tendency to rely to a greater and greater extent upon stock, the monetary value of the stock products amounting in

Table 6. Summary of Results on Yorkshire Farms, 1921-22 to 1929-30

Year	Number of farms	Gross result	Per acre			In terms of rental	As a per cent of capital invested
			£	s	d		
1921–22.....	38	Deficit	2	10	6	1.82	17.7
1922–23.....	55	Deficit	1	8	4	1.16	10.9
1923–24.....	70	Surplus	0	8	11	0.30	3.4
1924–25.....	88	Surplus	0	10	7	0.40	4.0
1925–26.....	80	Surplus	0	5	8	0.30	2.4
1926–27.....	77	Surplus	0	7	8	0.33	3.3
1927–28.....	84	Surplus	0	9	6	0.40	4.2
1928–29.....	85	Surplus	0	12	4	0.60	6.8
1929–30.....	36*	Surplus	0	18	5	0.80	8.4

* Completed records not yet to hand.

1921-22 to 49 per cent of the total, and in 1928-29 to 70 per cent of the total. During this eight-year period there has apparently been a tendency to rely more regularly upon the dairy herd, while

more attention must undoubtedly have been paid to the poultry section of the farm, as the value of the eggs and poultry produced represented 2 per cent of the total output in 1921-22, and 6 per cent of the total output in 1928-29.

On the other hand, following the sharp drop in cereal prices in 1922, the monetary value of the output of crop products has fallen very considerably, with the result that while the output of stock products in 1928-29 was 6 per cent greater than in 1921-22, the output of crop products was 55 per cent less and the proportional value of the cereal crops was reduced from 24 per cent of the total in 1921-22, to 14 per cent of the total in 1928-29.

Of the cereal crops the most serious reduction appears to have been made in the wheat crop, the output of which was valued in 1921-22 at £107 per 100 acres under cultivation while in 1928-29 it was valued at £30 per 100 acres under cultivation. On the other hand, there are indications that the attention of the farming community in Yorkshire is more and more being turned towards those crops which, like potatoes, carrots, peas for picking green, flax, and sugar beet, are to a greater or less extent protected naturally by their bulk or perishability, or artificially by governmental subsidy, and which will not, therefore, have to bear the full brunt of the ever increasing competition with foreign and overseas supplies to the same extent as do the cereal crops.

This adaptability of the Yorkshire farmers whose accounts we have had under observation is perhaps brought out best by a study of the yearly variations of the labour bill in comparison with the monetary value of the agricultural output (table 7).

That alterations in farm management have been accompanied by increasing efficiency in the organisation and utilisation of labour is self evident, for while in 1921-22 no less than 39 per cent of the production from the farm was required to meet the wages bill, in 1928-29, 26 per cent of the year's production sufficed to meet the same charge, although agricultural prices as a whole have dropped during that period relatively twice as fast as have the average weekly wages of the farm labourers.

ADVISORY SERVICE IN FARM MANAGEMENT

If any advisory work is to be efficient and really effective, the advisory staff must have a broad outline of world conditions; they must know their province through and through; they must know

its possibilities and capabilities; they must know intimately the varied problems of the agricultural industry as a whole, of their particular province in particular, and of the various districts of the province in which they are working; they must gain and hold the confidence of the farmers; as a team they must work and pull together; the foundations of their work must be laid upon sound knowledge and experience patiently and laboriously collected and the corner stone of their business must be *service* and not *self*.

An intimate knowledge of the province can only be obtained when the advisory officer knows not only the land but the men

Table 7. Labour Bill per 100 Acres on Yorkshire Farms and Per Cent of Output Required to Meet Labour Bill, 1921-22 to 1928-29

Year	*Labour bill per 100 acres*	*Proportion of output required to meet labour bill*
1921–22	£409	39.0
1922–23	283	38.0
1923–24	249	31.6
1924–25	249	31.0
1925–26	241	31.6
1926–27	240	30.6
1927–28	229	31.6
1928–29	215	26.2
Average (8 years)	£250	32.0

who are farming the land. Just as I know no two farms on which I could give exactly the same advice to the same man were he transferred from one holding to another, so I know no two men to whom I should think of giving exactly the same advice were they operating on, and responsible for, the management of the same farm. Each farm has its own specific problems and each man his own specific individuality, and the advisory officer who wants to make a success of his calling must make a study not only of the problems specific to the farm but of the individuality specific to the man.

This intimate knowledge of the man can only be possible when the advisory officer is himself living the life of the farmer, taking a personal interest in his difficulties, his joys, his sorrows, his success and his failure, and the farming community, slow as they are sometimes thought to be, are quick to find out whether an investi-

gator's interests are centered in them personally or in the information he is wanting to get out of them.

GAINING THE CONFIDENCE OF THE FARMERS

Coming to my own Province of Yorkshire some 25 years ago as science tutor and lecturer in farm book-keeping and finding no authentic records available for teaching purposes, I got in touch as soon as possible with some four or five men farming in different parts of the county on different types of land and with different marketing facilities, and persuaded them to keep accounts and to place their books at my disposal. None of these men were at that time well endowed as far as this world's goods are concerned. One was just starting farming with a capital of £400; today he is farming 300 acres and the net returns from the farm have averaged more than £3,000 or $15,000 per annum for the last three years. The alterations and modifications in his methods and system of farming during the period with which I have been in touch with him would take a whole session to describe. Suffice it to say that in spite of falling prices, the monetary value of the output of agricultural products which he produced for sale has increased from £4,505 in 1922-23 to £8,963 in 1928-29.

The second man was farming some 20 acres of accommodation land which was supporting 5 dairy cows, the milk of which he was retailing locally. Today he is the absolute owner of a small and compact holding of 80 acres surrounded by a ring fence; he has got together a herd of 17 dairy cows, a flock of 3,000 laying birds, and has built up a herd of 20 breeding sows. His total sales last year amounted to £3,542 and his net profits during the last three years have averaged well over £1,000 a year. In spite of an increased output of stock products and falling crop prices, the monetary value of his crop sales in 1929-30, when barley was selling at 28 shillings a quarter and potatoes at 30 shillings a ton, was actually higher than it was in 1921-22 when barley was fetching 80 shillings a quarter and potatoes 160 shillings a ton.

The third man was farming some 90 acres of what was little more than moorland at an elevation of between 1,000 and 1,100 feet above sea level and was struggling to keep his head above water. Today he owns and has paid for the whole farm; excellent sets of buildings have been erected; the farm is now carrying 70 dairy cows, 200 laying birds, while no less than 300 pigs were

last year got off fat. The total sales last year of what was once a little moorland farm amounted to £5,069 and the total profit made during the last ten years has amounted to £11,412, or an average of £1,141 a year. Not only has this man done well himself, but he has handed over as a dowry to his daughter on her marriage the deeds of a small farm of 60 acres and set up two of his sons on separate farms, one of whom is today actually making more money than his father.

Possibly there is no man naturally more reticent than the average Yorkshire farmer with a man whom he does not quite know; but I have met no one who is so ready to open out his heart to a man whom he has learnt to trust.

GETTING TO KNOW THE PROVINCE

A glance at a geological map of England and Wales will reveal the fact that practically every one of the geological formations sweeping round in a broad curve from southwest to northeast outcrops somewhere in the county of Broad Acres. Possibly there is no county in the country which has to so large an extent been subjected to glacial action, and one would expect, therefore, to find a big variety of types of soil and a consequent big variety in the type of farming. Actually there is to be found in Yorkshire every type of farming organisation met with in the whole of England, Scotland, Ireland or Wales, with the possible exception of the hop farms in Kent and Hereford and the presence of such inns as the Hop Pole and the Hop Grove, still fairly prevalent in certain areas, suggest that hops were grown in the county in the none too distant past.

A study of a contour map of the county shows that there will be big variations in altitude which again will affect farming conditions, and particularly the ratio of grass to arable farming. To the west we get the hills caused by the Pennine Uplift cut in two by the Aire Gap. To the north of that Gap lie the Permian Group, composed here almost entirely of mountain limestone; to the south lie the Coal Measure soils, here almost entirely millstone grit whose natural shortness of lime is still further depleted by the acidity of the rain due to atmospheric smoke pollution from the adjacent industrial areas of Yorkshire and Lancashire. Less than five per cent of the land in the whole of this area will be under the plough,

yet the methods of land utilisation and the systems of farming adopted will vary as widely as chalk from cheese.

To the east again, lie two upland masses, in the north the Hambledon and Cleveland Hills composed almost entirely of Jurassic rocks covered to varying depths by deposits left by the Great Scandinavian Glacier as it forced its way from the northeast over the summit of these hills. This land, like the upland to the west, is primarily hill-sheep land; yet the type of hill-sheep kept, the method of management, the supplementary farm enterprises, and the ratio of grass and arable land differ very considerably from the corresponding hill-sheep land to the west of the county. It is the only district I know in which roots are grown systematically for scaling on the grass or moorland to the hill-sheep in the winter. It is the only one of these hill-sheep areas in which land reclaimed is likely to prove an economic success and that land reclamation is only made possible as a result of glacial action and glacial deposit. When Professor Myers was with me some four years ago I had an opportunity of taking him over this area and showing him one such farm in the process of reclamation; he will be pleased to hear that this farm of 400 acres, bought at less than £8 an acre, is now a paying proposition and left last year, after paying 5 per cent on the purchase price and capital cost of improvement, a surplus of £680 to meet management charges and interest on a working farm capital of £3,160.

The hills in the southeast are the Wolds, a chalk escarpment, the continuation of that range which comes up in a bold sweep from the south of England, through Dorset, Wiltshire, Berks, Herts, Suffolk, Norfolk and Lincoln. It is an area of large farms with 83 per cent of its area under the plough, worked almost entirely by hired labour—an area naturally adapted to tractor labour, but in which tractors are conspicuous mainly by their absence. A district which, as far as stock are concerned specializes mainly in feeding, rather than in hill-sheep, and in the fattening of cattle almost entirely during the winter; a district whose main and in many cases only sale crop is barley. It is the district in which the depression is being felt more heavily than in any other part of the county, and a district in which the farming community are most difficult to move from their traditional methods of farming.

To the southeast of the Wolds lie the heavy boulder clays of the Holderness, growing possibly the best and heaviest crops of wheat

in the world, but growing them at too high a cost to compete with success in the world market of today. The land is adapted to the growing of beans, of mustard for seed and for the feeding of cattle on grass.

Between the two uplands of the east lies the fertile Vale of Pickering, the basin of a great glacial lake, the land bearing palpable evidence of lacustrine and glacial origin. This is an area in which drainage problems, complicated by cross glacial flows, are all important—drainage problems which may eventually necessitate the straightening out of the River Derwent or even changing the direction of its flow, as I hear has been done by American engineers in the case of the river at Chicago. It was in this area that the heavy floods, reported in the American papers a fortnight ago, occurred.

Running almost due north and south lies some of the best land of the county, though varying in type and quality; Lias and Trias marl and clay in the north, the great Glacial Plain of York in the middle, and alluvial deposits in the south, much of it natural or artificial warp. The most valuable warp is found near where the tidal waters of the Humber meet the confluence of the Trent and Ouse. There are thousands of acres in this area on either side of the Market Weighton canal, the deaf carr along the banks of the River Hull in the valley of the Derwent—land less than 10 feet above sea level and so subject to flooding that pumping operations have in some cases to be resorted to almost continuously, which, by means of warping drains still in existence, could, within two years, be reclaimed. It is covered to a depth of from two to three feet with the richest alluvial deposit imaginable and, if reclaimed, its rental value would be raised from 15 shillings to 40 shillings or 50 shillings an acre. Today we have four men reclaiming land in this manner and finding it an economic success. However, an advisory officer must be sure of his ground; he must know his levels; he must know the tide range and think not once but a dozen times before he suggests the advisability of any cooperator undertaking this method of land reclamation; for it is an expensive process costing today roughly £15 or $75 an acre.

Again, in the glacial area of the Great Plain of York there are thousands of acres of thin and sometimes blow-away sand with a high lime requirement, running back to heath and common or, if under cultivation, capable of growing poor crops of oats and rye.

In the Pocklington area, just at the foot of the Wolds, this light sand may overlie a chalky boulder clay. One of the men with whom we have been closely in touch for many years was farming 400 acres in this area, Here two feet of light sand were superimposed on about 20 feet of boulder clay containing 12 per cent of calcium carbonate. We suggested he should buy the farm and marl it. He did so and has already marled 260 acres with a dressing of from 80 to 90 loads an acre, doing this in the slack seasons with his own men at a cost of £5, 10 shillings, or less than $30 an acre. In six years the total net profits left by this holding have been sufficient to meet his living expenses and the full cost of capital and interest charges on purchase and improvements. Again one would have hesitated to recommend this process, even under suitable conditions, to any but an enterprising and progressive man, in a position to market favourably, the potato, carrot, sugar beet, and other protected crops like flax and peas for picking green, which this improved land was then specially adapted to produce.

A glance at a map showing the relative density of the population would suggest, as is actually the case, that the farming methods of the county will be influenced not only by type of soil and topography but also by marketing conditions.

To get to know a large and varied county of this description is the work of a lifetime, and a 25 years' study, far from exhausting the subject, has really touched but the fringe.

METHODS OF APPROACH

The methods of approach available to the investigator are as varied as the problems to be faced, but right through we have worked with the idea of "service" well in the foreground. With this object in view we adopted at first, full and detailed "costings methods" on every farm under investigation. This of necessity restricted our economic studies to a small and limited number of farms, but enabled us to help them very considerably, and when opportunities of extension occurred we were in the favourable position of selecting our men, and the selections were made with due regard to type of soil, size of the holding, method of farming adopted, altitude, and marketing facilities. For the last eight years we have had under observation the accounts of approximately 80 farms in varying parts of the county—farms varying in size from 5 to 1,500 acres. These have included rearing, breeding, and

sheep farms, wold farms, warp farms, small holdings, mixed farms for grain and stock, light arable farms specialising in rye, potatoes, carrots and peas, heavy arable farms specialising in wheat, beans and the winter feeding of cattle, farms specializing in milk production with mixed farming on grass, on arable farms with the soiling system, and with the use of the silo. On every one of these farms the results have been looked at first of all for the farm as a whole and subjected to as critical an analysis as possible with an eye all the time to gleaning all the available information which might be made use of as an aid to increased efficiency in farm management.

Later, by means of a modified costings system, ledger accounts have been opened and each separate enterprise charged with its share of the production costs of the farm as a whole, and a more detailed and comprehensive study of the separate entities of the farm made. After this further study a detailed report is sent to each cooperator and constructive and destructive criticism offered —criticism which has been frank, sometimes brutally frank, but which has always been accepted in the spirit in which it was offered. The information collected in this way has been valuable, interesting and instructive; the samples have been small but very carefully chosen, and from each, all the information available has been extracted, classified, and critically examined, and while the samples have been small the information with reference to each farm has been as complete as we could make it.

In order to widen the scope of our work, each year one or more detailed commodity or enterprise studies are made on a more extended basis, and as far as stock are concerned, we have completed these studies in the case of milk and pork production as well as of poultry, and are at present engaged in an investigation into the various methods of sheep management. As far as crops are concerned, investigations have been made into the growing and marketing of potatoes, flax, sugar beet, peas for picking green, and a wheat survey is now on the way. Our method of attack may be illustrated in the case of a poultry investigation made in 1928.

The Ministry of Agriculture are approached and the poultry population obtained parish by parish. These are then plotted to scale, in this case one dot for every 200 birds. A bird's-eye view of the relative poultry concentration in different parts of the county is thus obtained and this map is viewed in the light of the soil,

contours, density of population, possible markets, and road and rail communication. We next note the position of each of the 80 original cooperators who are making any attempt at poultry keeping and see where our samples are inadequate or incomplete. It is an easy matter then, by means of our eight district lecturers stationed at different parts of the county, our lecturers in poultry husbandry or the various secretaries of the Farmers' Union to get into touch with any required number of poultry keepers in the areas not sufficiently covered. If in any particular area we want four additional men we should ask for eight names, interview the eight and make our own selection. These men, who are visited personally three or four times during the year, keep for us the detailed records which we suggest with reference to that particular enterprise.

In this way, broader information is gradually being accumulated and the disadvantages of the smallness of our original sample are gradually being overcome.

Incidentally, it may be of interest to state that as a result of this particular investigation which revealed that by far the greatest concentration of poultry in the county is to be found in the upland of the southern Pennines on land not particularly adapted to poultry culture but in close proximity to the markets both of the industrial area of the West Riding and of Lancashire, and that one of the least dense concentrations is to be found on the Wold uplands of the East Riding, an area suffering heavily as a result of the agricultural depression and lack of market facilities, we have taken the bold step of suggesting the opening of a large egg collecting and grading station at Beverley, in the very centre of this area, holding the view that while the mountain may not come to Mahomet, Mahomet may at least go to the mountain and as Mr. Dykes and Mr. Hinton will know the experiment is proving an undoubted success.

During the last three years, in addition to these commodity or enterprise studies, detailed surveys have also been made of the three separate sections of the county, thus helping still further to broaden our outlook and widen our sphere of action.

LESSONS TO BE LEARNED FROM THESE STUDIES

A study of the results obtained during this period when looked at as a whole or in relation to the variations of their financial and

economic success, brings out many points of practical interest to the man who is farming, or thinking of taking a farm.

SIZE OF FARM

Our own limited number of results goes to show that so far as size is concerned, the peak of maximum efficiency is apparently reached on a holding of somewhere between 100 and 150 acres, though the data at present available is not sufficiently large for the evidence to be conclusive. Actually there are indications that the efficiency curve of holdings of various sizes in our county is not a continuous one but has two peaks, the first for the family farm of the size already mentioned beyond which peak the curve falls, only to rise again to a second crest somewhere about 350 acres, from which point it appears to fall as the holdings increase beyond that limit.

As we see things the success of English farming lies neither in the extremely small holding of Denmark, Switzerland or Germany, nor in the large ranch or the industrial or collective farms of South Africa, the Far West or Soviet Russia. It is certainly not without significance that we have never been able to include any holding under 50 acres or over 500 acres in our list of really successful farms, when we limit success to those leaving a return of at least 15 per cent on working capital commitment.

In this respect a study of the following table, illustrating the variations in the number of holdings of various sizes during the last 40 years, is certainly instructive (table 8). It will be seen that, in England and Wales, the tendency has certainly been in the direction of the gradual elimination of the large holdings and also of those which have been found in practice to be too small for economic working. In spite of the repeated efforts made to encourage the small holding movement, economic forces have slowly but surely worked in the direction of the medium-sized farm, hovering round the hundred acres, which our limited results suggest to be, in this county at least, one of the best economic units.

The last published figures of the Ministry of Agriculture reveal the fact that, during the last 40 years, the actual number of statutory small holdings in England and Wales has been reduced by more than 53,000.

LOCATION

That the present day problems of the farmer are those of marketing rather than production is suggested by the fact that during a period of eight years, of these really successful records, 59 per cent come from the West Riding with its teeming industrial population, and 37 per cent come from the North Riding, most of them from farms situated within easy reach of the Cleveland area, the markets of which are second only to those in the industrial area of the West Riding, and only 4 per cent are from the East Riding,

Table 8. Distribution of Holdings in England and Wales According to Size, 1885-1926

Size group (acres)	*Year*				
	1885	1895	1913	1921	1926
1–5	114,273	97,818	92,302	81,217	74,185
5–20	126,674	126,814	122,117	116,159	108,814
20–50	73,472	74,846	78,027	80,967	78,827
50–100	54,937	56,791	58,287	61,001	61,063
100–300	67,024	68,277	64,431	67,842	67,169
Over 300	16,608	16,021	14,513	12,947	12,580
Total	452,988	440,567	435,677	420,133	402,638

which possesses no great centre of population except Hull, which as a port is dominated by its import trade. In a district far removed from a consuming market the importance of being near to a station or in close proximity of a really good road in these days of motor transport and refrigeration cannot be over emphasised.

The fact that with these successful men potatoes and barley have, over the whole period, been the main sale crops would suggest that the successful farm is more likely to be found on light land or medium loam than on heavy clay—a supposition which gains support when it is seen that these farms have also produced more peas, carrots and sugar beet than the normal farm. Actually we have not yet been able to include in our list of successful farms any holding, grass or arable, situated on heavy clay, unless in a district favorably situated for the disposal of milk in liquid form.

GRASSLAND OR ARABLE

It is next to impossible for an arable man in an old country to do well without stock to produce manure to maintain the fertility

of his land. He may adopt simple or complex series of crop rotations, he may go in for catch cropping and green manuring, supplemented by dressings of artificial fertilisers, but, as we say in Yorkshire, "there is nowt like muck." This, the older countries have found out long ago, and the newer countries, as the inherent fertility of their virgin land is beginning to show signs of exhaustion, are beginning to realise it at last. Furthermore, the cheapest food for stock is still grass, well managed.

On the grassland farm, if stocked up to the hilt by cattle, dairy cows, sheep, pigs or poultry, manure will be produced in abundance, but cannot be utilised to the best advantage unless there is land under the plough on which sale crops can be grown, by means of which the accumulating fertility can be cashed direct.

A study of our records during the war and post-war periods shows quite conclusively that in good times it will be the arable man who will make most, and in bad times the grassland farmer who is likely to lose least.

If, therefore, a man is adopting the bolder policy and farming with a view to making money rather than to cutting down his expenses, there is no doubt that a blend of grass and arable land is desirable, and it would appear from our Yorkshire records that, except under very abnormal conditions, one of the happiest blends would be one of rather less than two-thirds grass and rather more than one-third arable. In my own mind, I have no doubt that the policy of our farmers in laying down land to grass from 1870 up to 1914 at the rate of 73,000 acres a year, and from 1919 to 1929 at the rate of 223,000 acres a year has been carried too far, not only nationally from the point of view of production, and socially from the point of view of unemployment, but also financially from the point of view of the farmers themselves.

Many a man in our country, and if I may judge from what I have seen in this country, the same is true, has made the fatal initial mistake of taking the wrong farm, and we are finding an increasing number of applications coming in for advice and guidance in the taking and selection of the holding.

RELATION OF VARIOUS FACTORS TO RETURNS

A study of the records of those men who have made and are making a success of their farming will give us some indication as to what the farmer should do with his farm after he has taken it.

These men are going in for high production, and adapting their methods to present day requirements. Mr. R. J. Thompson, in a paper read in 1926 before the Royal Statistical Society, shows that the quantity of agricultural products produced on the holding, and either sold or left available for sale, is valued in England and Wales at £817 per 100 acres, and in Denmark at £1,115 per 100 acres. On the whole of the farms in Yorkshire whose accounts have been under investigation, the output per 100 acres has been found to agree quite closely with Mr. Thompson's estimate, but on the farms which, from the economic standpoint, have stood out as being pre-eminently successful, the production has been

Table 9. Relation of Various Factors on the Most Successful Yorkshire Farms to the Average for all Farms

Factor	*Average of the most successful farms*			*Average of all farms*		
	£	s	d	£	s	d
Capital invested per acre	14	11	0	13	0	1
Rent per acre	1	9	6	1	4	2
Rates per acre	0	6	9	0	4	0
Total expenditure per acre	15	6	0	11	16	6
Foodstuffs bought per acre	2	16	0	1	17	0
Fertilizers bought per acre	0	12	2	0	10	8
Labour bill per acre	3	2	5	2	6	0
Number of men employed per 100 acres	3.02			2.34		

80 per cent above the normal for our country and 30 per cent above that of Denmark.

Apparently, therefore, the salvation of British agriculture is not to be found along the lines of ranch farming, and diminished production, and if the industry is to come to its own again it must do so by means of increased output and increased sales.

That it still pays to farm intensively is brought out quite clearly from a study of the above table, summarising our records for the last eight years (table 9).

The interesting thing is, that on these successful farms, not only has the output been high on the acreage basis but in spite of the heavy expenditure and high capitalisation it has been high in proportion to the production costs, the rent paid, the labour bill, the men employed and the capital invested.

With information of this kind in front of us we have had no

hesitation whatsoever in expressing our views quite frankly to men who had previously been convinced that the only hope for agriculture in the present days of low prices lies in cutting down of expenditure and reducing both the output and the production costs.

The subject of land utilisation is one of vital importance as far as the economics of farm management are concerned, and we have found ourselves in a very strong position in our advisory capacity when our available records, covering a series of eight years (1921-29), have brought out the following facts:

1. The land utilised for growing for direct sale off the farm, crops naturally or artificially protected, has produced each year

Table 10. Relation of Output on the Most Successful Yorkshire Farms to the Average for all Farms

Factor	*Average of most successful farms*	*Average of all farms*
Output per 100 acres	£1,400	£780
Output per man employed	470	336
Output per £100 spent on labour	450	320
Output per £100 production costs	140	104
Output per £100 rent paid	970	680
Output per £100 working capital invested	96	61

crops to the value of £22, 9 shillings, 7 pence per acre and left an average net profit of £5, 15 shillings, 5 pence per acre.

2. The land which has been utilised for growing for direct sale, cereal crops not thus protected, has produced each year for sale, crops to the value of £7, 5 shillings, 3 pence per acre and left an average net profit of £2, 14 shillings, 3 pence per acre.

3. Land, the produce of which has been placed at the disposal of poultry, has produced eggs and poultry to the value of £15, 4 shillings per acre and left an average net profit of £7, 5 shillings, 0 pence per acre.

4. Land, the produce of which has been placed at the disposal of breeding sows, has produced pork to the value of £27 per acre and left an average net profit of £4, 16 shillings per acre.

5. Land, the produce of which has been placed at the disposal of dairy cows has produced milk and dairy products to the value of £12 per acre and left an average net profit of £2, 8 shillings per acre.

6. Land, the produce of which has been placed at the disposal of breeding ewes, has produced mutton and wool to the value of £2, 18 shillings, 3 pence per acre, and left an average net profit of 6 shillings per acre.

7. Land, the produce of which has been placed at the disposal of feeding pigs, has produced pork to the value of £9, 6 shillings per acre and left an average net profit of 2 pence per acre.

8. Land, the produce of which has been placed at the disposal of feeding sheep has produced mutton and wool to the value of £4, 10 shillings per acre and shown an average net *loss* of £1, 10 shillings an acre.

9. Land, the produce of which has been placed at the disposal of the feeding cattle, has produced beef to the value of £3, 4 shillings, 3 pence per acre and shown an average net *loss* of £3, 6 shillings, 6 pence per acre.

With this information available we have felt ourselves on surer grounds when our advice was asked with reference to any suggested modifications in stock management, or as to the advisability of laying down any specific area under grass. In many cases marked improvements have been made in the financial position of the farm as a whole, not by eliminating feeding cattle altogether but by making such modifications in farm management as will ensure that this branch of stock, so frequently unremunerative will not absorb too great a proportion of the total energies of the farm.

CAPITAL TURNOVER

One of the difficulties under which the agriculturist must always labour is the comparative smallness of his capital turnover, due largely to the fact that as a rule he may have for sale from each unit of land only one crop each year, and that from the nature of his calling he must be carrying a large proportion of dead or non-productive capital. While in no system of farming would it ever be found possible to obtain the kind of capital turnover obtainable in other forms of business, yet there is no doubt that it is possible in many ways to increase it considerably with advantage. The simplest ways of doing this are to make more use of the milk cow, the breeding sow, and the laying hen; to increase the sale crops at the expense of the root break, and to aim at getting off the stock at an earlier state of maturity. While this inherent disadvantage can never be entirely rectified, yet it

can, by the internal organisation of the farm, be considerably minimised, and we have on our books farms on which, even in the worst days of the slump, it has been found possible to turn over the working capital investment, more than two and a quarter times.

RETURNS ON PROTECTED PRODUCTS

The total yearly value of liquid milk produced in our country and disposed of as such is roughly £50,000,000; the total value of imported milk products which come into direct competition with liquid milk was last year £6,000,000; hence the price of liquid milk in the home market is largely determined by the home supply, and the price at which it would be sold, both wholesale and retail, could be fixed by the men who are producing it, if only they realised the strategic strength of their position and the spirit of loyalty were more strongly developed.

On the other hand, if the milk producer is disposing of his milk in the form of butter or cheese, the price that he will have to accept will be influenced, and influenced largely, by foreign competition. In 1925, butter to the value of £53,204,417 was imported and in the same year butter to the value of £5,780,000 was produced for sale within the country; in other words the home produced butter formed less than 10 per cent of our total supply. Liquid milk must be fresh with the result that no appreciable overseas supplies reach us; butter will keep, with the result that large supplies reach us from Denmark, New Zealand and Australia, and if we wish to compete in the open market for the butter trade we must either be prepared, so long as our present fiscal policy continues, to place upon the market a sample of better quality or accept the price that these countries are willing to take. Over a series of years our producers should have a bigger chance of making money through the sale of liquid milk than through that of butter and cheese, and through the growing of potatoes, sugar beet, flax, carrots, cabbages and peas for picking green, than of the ordinary cereal crops.

These naturally protected products will be subject to more violent fluctuations of price levels than those on which the world markets have a steadying influence; they will possibly be more speculative and in times of glut, as in the case of the potato trade today, they may involve serious losses to the producers if attempts are made to force the whole of the crop on an already overcrowded

market; but it is here that money is to be made most readily; furthermore, speculation would lose more than half its risks were there introduced more organised and orderly systems of marketing these products.

CHOICE OF ENTERPRISES

With many of the stock and crop products already mentioned more or less speculative, the wise man will cover his risks.

Possibly it may be stated that there are no gilt-edged securities in agriculture; that no section of the farm is, or possibly could

Table 11. Average Profit per Laying Bird on Yorkshire Farms Keeping Poultry, 1920-21 to 1928-29*

Year	*Average profit per laying bird*	
	s	d
1920–21	14	2
1921–22	9	9
1922–23	3	0
1923–24	3	10
1924–25	4	6
1925–26	2	11
1926–27	4	6
1927–28	4	2
1928–29	4	5

* Farms whose accounts were under investigation by the University of Leeds.

be, looked upon as in any degree "fool-proof." With this I am not altogether in agreement. From the outbreak of the war up to, and including, the present time, poultry, as far as our observations go, have been, if not fool-proof at least as fool-proof as any section of the farm, under our present fiscal policy, is ever likely to be. Actually, in spite of that fact that up to quite recently possibly no section of the farm has received so little attention, they have left good returns (table 11).

With the depletion of our laying stock during the war and the collapse of Russia, eggs remained up to 1927 the one agricultural product, the demand for which in the home market exceeded both the home and the imported supply. Egg producers in the home country are to be congratulated upon the fact that just at the time when the combined home and imported supply was beginning to

get ahead of the demand, an improved egg marketing scheme should be launched by the Ministry and legislation passed for the compulsory marking of foreign eggs.

As far as sheep are concerned, the numbers have only fallen in England from twenty million in 1868 to thirteen million in 1928. The fact that they can live on a scanty herbage of relatively poor quality makes them the pioneers and advance guard of civilisation in new countries. The fact that they give a relatively small output and capital turnover tends to push them relatively into the background, as with the advance of civilisation, farming methods develop on more intensive lines. The relative importance that sheep

Table 12. Relation of Size of Holding and Per Cent Which Mutton and Wool is of Total Output, Yorkshire, England*

Size of holding (acres)	*Total output per acre*			*Output of mutton and wool per acre*		*Mutton and wool as a per cent of total output*
	£	s.	d.	s.	d.	
20–50	27	12	0	9	4	1.6
50–100	19	12	0	10	—	2.7
100–150	12	5	0	14	—	5.7
150–300	11	10	0	19	2	8.3
Over 300	5	0	0	19	5	21.0

* Farms whose accounts were under investigation by the University of Leeds.

tend to play in the internal economy of holdings of different size and land values is brought out by a study of the records of the farms whose accounts we have had under investigation during the last ten years (table 12).

However intensively the land is worked it is still possible to find a place, and an important place, for this class of stock on most farms. To a large extent they may be made to act as scavengers of the farm, clearing up after the dairy and other cattle, running over the seeds in winter, getting an early bite in the spring before the other stock are turned out on to the grassland, or being folded on sugar beet tops before the land is ploughed up for wheat.

Production and the type of production must be influenced not only by the type of soil, altitude and weather conditions, but also by the position, transport, and market facilities.

This can be well illustrated in the case of Yorkshire by a study of maps of the county showing:

(a) The type of soil.
(b) The contours.
(c) The density of population.
(d) The distribution of the potato and sugar beet crops. Both crops require the same type of soil, though possibly the sugar beet crop wants more depth, and certainly is more susceptible to soil acidity; both grow naturally at the same altitude but both do not cater for the same market—hence the distribution of the area under cultivation of the two crops varies considerably.

There has been, during the past three years, a big increase in the area under flax grown for fibre in Yorkshire, and the growing

Table 13. Relation of Rent per Acre and Per Cent Which Mutton and Wool is of Total Output, Yorkshire, England*

Rent per acre (shillings)	*Total output per acre*			*Output of mutton and wool per acre*			*Mutton and wool as a per cent of total output*
	£	s.	d.	£	s.	d.	
Over 40	14	9	0	0	10	5	3.6
30–40	14	18	0	1	2	0	7.3
20–30	8	18	0	1	4	3	12.5
10–20	6	16	0	1	2	3	16.1
Under 10	1	9	6	0	11	7	38.0

* Farms whose accounts were under investigation by the University of Leeds.

of the crop has proved quite a financial success, leaving, as far as our records show, an average net profit in 1928 of £5, 4 shillings, 10 pence per acre, and in 1929 of £7, 6 shillings, 5 pence per acre. One could find thousands of acres of land suitable for the growing of this crop, in different parts of the county, land farmed by men who are anxiously seeking an additional remunerative sales crop, but it is no use suggesting to those men that they should grow flax, unless they are situated within a fifteen or twenty mile radius of either Selby or Staddlethorpe, the only two places in the county possessing factories capable of handling the crop, for it is a bulky crop and heavy transport costs will kill it.

Even if the farm is close to the factory it is no use growing the crop unless precautions have been taken beforehand to get contracts signed for acceptance of delivery, for, with no other market available, it would be the height of folly to grow a crop of this description in excess of the factory requirements.

While many points of general interest come out from a study of our records and certain broad and general conclusions can be drawn from them, the problems of the farm and the individuality of the farmer are so varied that advisory work on farm management can never be carried out successfully on any rule of thumb methods, and each farm and each farmer must become a specialised field of research and investigation.