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PROGRESS IN ENGLISH
FARMING SYSTEMS

VII
THE FLEXIBILITY OF FARMING

By
A. BRIDGES
assisted by E. L. JONES

Price One Shilling and Sixpence net

OXFORD, AT THE CLARENDON PRESS
LONDON : HUMPHREY MILFORD
1933

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*Proving, improving, ditching, trenching, draining,
Viewing, reviewing, and by these means gaining;
Planting, transplanting, levelling, erecting
Walls, chambers, houses, terraces; projecting
Now this, now that device, this draught, that measure,
That might advance his profit with his pleasure.*

SIR WALTER SCOTT,
The Bride of Lammermoor.

NOTE

IN the last of this series of reports, descriptive of experience in the application of new principles of farm management, an account was given of a specialist in farming both for crops and for live-stock products. It was a farm devoted to mixed production but not to mixed husbandry, which is to say, that although a variety of commodities was turned out, each was produced, so far as possible, without that degree of dependence on the others which is the underlying feature of all established systems of mixed farming. Corn-growing was independent of the sheep-fold or the dung-cart; milk production was an independent business; labour-staffs were specialists each in their own departments.¹ The farm which Mr. Bridges describes in the following report has many points of similarity in its organization and practice as it stands to-day. It consists of a series of separate businesses, some of them, dairying for example, being entirely specialized, both for their land and their labour requirements; others, pigs for example, being combined with the production of saleable corn and roots in a way which makes them a combination of the old idea of interdependent crop and stock-farming and the modern notion of strict specialization.

Apart from the confirmation of the soundness of the new principles of organization, already described, which this further example affords, its principal interest lies, perhaps, in the way in which it has been evolved. Starting farming, at the end of the War, upon a very moderate farm in the Peterborough district, and pursuing the traditional local practice, Mr. W. S. Abbott was led to consider the modifications which he has since introduced through the evidence of the relative profitability of the different branches of his farm afforded by his cost accounts. This led him, step by step, from stock-raising and feeding to dairying, and from wholesale selling to the retail distribution of graded milk. It led him from turnips and hurdle sheep to sugar beet and a grass flock. It led him from pig-sties and the dung-cart to open-air pig keeping and four-legged manure distributors. Above all, it led him from the principles of mixed husbandry to rigorous departmentalism in the division of his land, in the use of labour, and in the

¹ Orwin, C. S., *High Farming* (Progress in English Farming Systems, VI). Clarendon Press, 1931.

selection of his products. Rarely is the value of accountancy as a guide to policy and management realized so clearly.

The Institute wishes to thank Mr. Abbott very cordially for the readiness with which he has made his records available for study, and for his collaboration in the production of this report. The agricultural economist's laboratory is found on the farm and in the market, and he is dependent upon the co-operation of those engaged in rural industry for much of the apparatus of his research work.

This report is the seventh of a series which aims at the study of farming systems representative of departures from accepted local practice, undertaken at the Agricultural Economics Research Institute under a special grant made by the Ministry of Agriculture and Fisheries, with the sanction of the Development Commissioners. It is not claimed for any of them that they indicate short cuts to prosperity for all and sundry, but as the cases selected for description have special features to which must be attributed such success as their originators have attained, they may stimulate others to reconsider their own problems in the light of their own circumstances.

C. S. ORWIN,
Director.

AGRICULTURAL ECONOMICS RESEARCH
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I. INTRODUCTION

THE depression through which farming has been passing since the Great War has made it hazardous for farmers to carry out changes in policy which might be warranted in times of prosperity, and it is not to be wondered, after the series of shocks which they experienced in recent years, that policies of retrenchment have been more popular than those of construction. Nevertheless, in the face of continued adverse conditions, trimming the sails cannot be carried on indefinitely, and sooner or later a new tack must be made if progress is to be achieved and profits earned once more.

Here and there in the country enterprising men may be found who are giving a lead to others by the systems of farming that they have evolved, and the experiences of some of them have been recorded in this series of pamphlets.

The account which follows places on record the methods of a man who began to farm towards the end of the war period, when labour and all farm requisites were scarce and conditions were very difficult; who went through the period of feverish prosperity after the war which preceded the collapse from 1920 to 1922, following the deflation of money; who went on while values slowly stabilized themselves up to 1929, and who carried on, on an extended acreage, employing more labour and intensifying his production, during the subsequent years of great difficulty.

The record shows how he set himself to adapt his system of farming to the needs of the times, with such measure of success as his accounts show. His experience illustrates the flexibility of farming practice, and is a stimulating example of courage and enterprise in the most difficult times that farmers have experienced for a generation.

The record is concerned with two farms, Sacrewell Farm and Sacrewell Lodge Farm, both in the occupation of Mr. W. S. Abbott. It has been divided into two periods: (1) from 1917 to 1928, when Mr. Abbott occupied Sacrewell Farm only, and (2) from 1929 to 1932, when the two farms were run as one, Mr. Abbott having taken over Sacrewell Lodge Farm in the spring of 1929. The record of the first period is one of good farming under the best principles of traditional local management. That of the second period describes the drastic changes introduced into the established

practice in order to meet the urgent needs of the times for something better adapted to the conditions. Its value lies in the fact that it is a record of expansion and progress, of increased production from the land and of employment upon it, achieved economically, on the whole, at a time when the reduction of costs and of output are generally in evidence.

II. THE FIRST PERIOD, 1917-28

1. *The Farm*

Sacrewell Farm is situated in the Soke of Peterborough standing on the Great North Road eight miles west of Peterborough and six miles south of Stamford. The tenant entered into occupation in 1917, when the farm extended to 339 acres, of which some 246 acres were under the plough and 93 acres were permanent pasture, roads, and buildings. Twelve acres of rough grass were immediately broken up, and a further nine acres in 1924. Eleven acres of arable land were cut off in 1927 on the construction of a by-pass road, so that the original holding extends to-day to 328 acres, of which about 256 are in arable cultivation.

The underlying rock formation is oolitic limestone. The surface soil, for the most part, is a brashy, free-working, light loam, but near some intersecting watercourses it becomes deeper and better, with some small pockets having a high percentage of humus. The annual rainfall is little more than 20 inches, and the west side of the farm, where the soil is very porous and stony, suffers from drought.

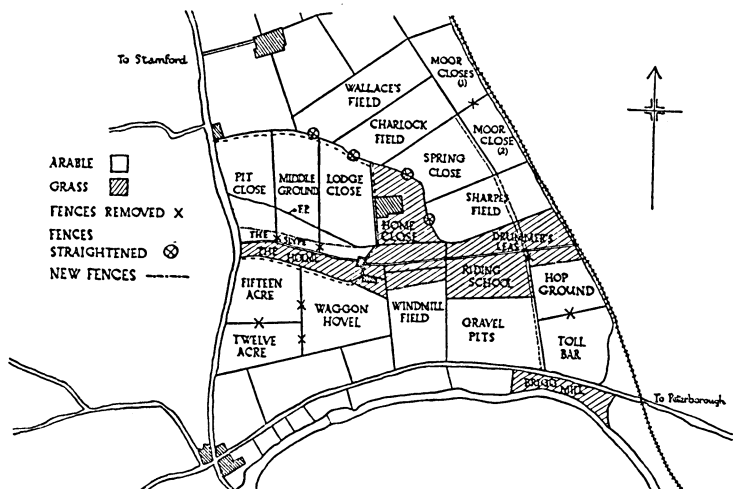
The small acreage of permanent grass, which has been much improved by slagging, and which is now very useful, comprises the untillable low-lying land found alongside the watercourses and the small paddocks round the buildings, which also give access to the arable fields. The arable land, well supplied with lime, is level, and laid out in fields of convenient shape and size—15-25 acres.¹ The soil on the arable part of the farm is not regarded as being of the type which makes good permanent pasture.

The present lay-out is good in so far that the fields are

¹ In the middle of the nineteenth century Sacrewell Farm and the farm to the north of it were replanned by the Duke of Bedford, to whom the farms then belonged. Fences were straightened, some fields were enlarged, and new hedges planted where necessary. A considerable amount of tile-draining, also done about the same time, replaced the older stone drains.

enclosed within a ring fence. The farm buildings are central, commodious, well constructed, convenient, and adequate for the holding. They include a water-power grist mill.

Satisfactory roads to the stock-yards render all fields accessible, though they were in some cases circuitous and inconvenient. Diversion of old routes and construction of



some new roadways has effected a great saving of time and labour in cartage.

The holding is favourably situated. A main road to Peterborough adjoins the southern boundary; the Great North Road forms the western boundary, and the eastern boundary runs alongside a branch line of the Great Northern Railway. There are two stations within three miles of the farm buildings. Peterborough and Stamford provide local markets for stock and cereals. Sugar beets are consigned to the Peterborough factory. Potatoes are sold as far afield as London and Leicester.

2. Condition of Farm at Entry

Mr. Abbott entered upon the farm at Old Michaelmas, October 11th, 1917. His relations with his landlord were such that he was free to make permanent improvements, knowing that he would have undisturbed possession. The farm was in a farmed-out condition. The number of stock maintained had been decreasing; crops had been continuously

sold, with little return to the land, until yields had fallen very low.

Cultivation had been neglected and only the surface soil was moved. The arable land was foul, many fields being entirely covered with couch grass. Hedges, neglected for years, were so high and spreading that cultivation was impossible within several yards of them. Some, planted seventy to eighty years before, were beyond repair, and large sections of the tile drains had fallen into disrepair and required re-laying. Tree roots had caused blockage; in places the drains had sagged owing to the subsidence of pockets of peat and the drainage water collected to form large, wet patches over the arable land.

Some of the fields were irregular in shape, and some differed so much in physical and soil conditions as to make economical working impossible.

3. *Tenant's Improvements*

Much work had therefore to be done in the early years of Mr. Abbott's tenancy to remedy the defective state of the farm when it was taken over. The principal improvements consisted of (1) the removal of hedges, either because they had got beyond repair or were definitely a hindrance to cultivation, and (2) the planting of new hedges where, owing to irregular boundaries or because of soil differences, adjustments of the hedges between arable and grass fields seemed to be desirable. Altogether 2,000 yards of hedging were removed and 1,700 yards were planted with quick, protected by post and wire fencing.

A new farm road, approximately 600 yards in length, was made on the eastern side of the farm to give direct access to the Peterborough road and to the local station, thus facilitating the dispatch of sale crops from this side of the farm. Prior to the making of this road crops were carted across the farm westwards to the Great North Road and thence eastwards along the Peterborough road, quadrupling the length of the journey.

A series of artificial fish-ponds abutted on the mill stream. These were drained, filled up, and ultimately seeded down at considerable expense and incorporated in the adjoining pasture.

Other improvements effected in the early years consisted of taking up and re-laying tile drains wherever necessary,

improving the road into the farm, and reconditioning the water-power mill. The mill-pond and water-wheel were in fair condition when the farm was taken over, although the mill had not been operated for twenty-five years. In 1925 the structure was reconditioned and the interior arranged for the convenient handling and storing of foods.

Practically all the permanent improvements mentioned have been carried out by the regular farm staff, and all have been paid for out of profits. No attempt has been made to distribute the cost over a series of years, the cost of all improvements in one year being charged to the establishment account of that year.

4. *Farming Policy*

Cropping.

In principle, the four-course system of cropping was followed during the first period now under review:

Cereal (Barley)
Seeds
Cereal (Wheat)
Roots and Potatoes,

but not to the exclusion of other crops which might be expected to show a profit. At various times tares, mustard, kale, and flax have been grown for seed, fibre, or fodder.

Cereals and 'other crops' taken together accounted for approximately half the average arable acreage, roots and fallows for one-quarter, and seeds and leguminous crops for the remaining quarter. Clover and rye-grass were the main seeds mixture, with occasionally sainfoin. The leguminous crops were usually mixtures of oats or wheat with beans, peas, or vetches.¹

The acreage under seeds was maintained at about 30 to 40 acres from 1918 to 1926, and increased in 1927 to 59 acres as a means of overcoming the difficulties of establishing permanent pasture, so that more live stock might be kept.

The main cereal crop was wheat, which comprised on the average 65 acres, or 24.9 per cent. of the total arable acreage. Barley occupied 13.4 per cent., and oats—favoured neither by the soil nor the climate—6.9 per cent. Barley was grown on a decreasing acreage. The light land has a reputation for

¹ The acreage under the various crops for the years 1918-27 is shown in Appendix, Table I.

good malting barley and, prior to entry, it was the main cereal, but, owing to the uneven soils on most fields, Mr. Abbott found it difficult to get good samples, preferring wheat as being more suitable for the land. Many varieties of wheat were tried, including Squarehead, White Victor, and Little Joss, of which the latter was found to be the most satisfactory; it stands well on this land. Of barley, Spratts Archer, and of oats, Black Winter, were usually grown.

Roots included mangolds, swedes, and turnips, together with some form of cabbage or kale crop to be fed off. Potatoes occupied a proportion of the root break, and in the later years sugar beet was added.

Bare fallows are unusual on this land, but were of necessity resorted to upon entry, when the land was very foul.

Mangolds are the only root crop which was maintained in acreage throughout the first period. The acreage of swedes and turnips, traditionally associated with the light arable soils, was reduced very early in the operation of the farm, and after 1926 they were entirely omitted. Several reasons dictated the change. They were too expensive in man labour, and kale and rape were found to be cheaper. Also the sugar-beet crop, of which about 30 acres were ultimately grown annually, was introduced in 1926 and this, besides being a profitable crop, provided excellent sheep keep in the tops and leaves. It was, therefore, no longer necessary to grow root crops specially for sheep.

Main-crop potatoes were consistently grown for sale; on the average the area devoted to the crop amounted to 18 acres. King Edward was the principal variety grown, and although yields were not high this was compensated to some extent by a ready sale at good prices. Arran Chief was also grown. Mainly to save the labour of haulage and also because of the rather better soil, the potato crop was entirely confined to the east and south-east sides of the farm on the fields lying nearest to the new farm road which leads out to the Peterborough road and to the local station.

Beans and peas were not grown after 1920.

Catch crops of rape and turnips following oats and tares cut for hay were tried, but conditions are, on the whole, unsuited to a system of continuous cropping or catch cropping.

The eastern side of the farm was more intensively farmed than the western side, with its rather poorer soil, where

orthodox roots for feeding have alternated with grain and seeds. But the sugar-beet crop afforded an opportunity to intensify the cropping of the western side also, as it can be grown on fields on this side adjoining the Great North Road conveniently placed for motor transport to the factory.

Live Stock.

For the first year of the tenancy the farm was almost without live stock, apart from the working horses, but from that time onwards, live stock played an ever-increasing part in its development and economy.

Cattle. In the first two years, before the farm was fully stocked, strong store cattle were wintered in yards for Northamptonshire graziers. From 1919 to 1923 a store-raising policy was pursued, which was the system practised locally. A herd of about eight Lincoln Red cows was maintained, each cow rearing from four to five calves. Calving was generally in early spring, and the rearing calves, mainly Lincoln Reds and Shorthorns, were obtained from local markets. The young steers were sold in the spring and summer.

But store-raising was abandoned after 1924. The cost of suitable calves was too great, and there was considerable difficulty in obtaining good ones, while the yearlings made no use of the straw and roots produced on an arable farm. During this phase, some baby beeves were turned out at 15 months old, but buyers at local markets considered them neither beef nor veal.

From 1924 yearling stores, Irish Shorthorns and Polls, were bought in the autumn and sold after two winters, but with no better success, for the expense of root-growing and cartage, and the slowness of turnover, rendered this venture unprofitable.

In 1926 additional buildings and 32 acres of grass-land were taken, and Mr. Abbott entered upon milk production. This, however, belongs more particularly to the second phase.

Sheep. In 1918 a flock of about 50 Oxford Down sheep was established. By 1923 the flock had been increased to 100 ewes, and from then up to 1928 it was kept at this strength. The flock was maintained largely on seeds and kale. No *close* folding was practised, and after the introduction of sugar beet the ewes were given the run of sugar-beet tops, on which, with the addition of seeds-hay, they have done excellently.

Over the ten years to 1928 the average number of lambs reared was 128 per 100 ewes, which is good for a flock of the Down breed. The lambs were sold fat during the summer off the grass and as autumn stores. There was no winter feeding of wethers. Ewe lambs were retained to maintain the flock at strength.

Scotch half-bred (Border Leicester \times Cheviot) ewes were tried in 1924 and 1925 alongside the Down flock. A Hampshire ram was used on each flock. On the average there were no more lambs, and the half-bred lambs sold for rather less money than the Down lambs. As at this time fodder roots were still being grown, there appeared to be no economy in the half-bred sheep.

Pigs. In the early years of the tenancy pigs were kept merely as a side-line. Mr. Abbott found, however, that even in a small way they were quite profitable, and consequently the stock was increased, particularly after 1923. By 1927 37 sows under the supervision of one man were being kept, and the department had become one of the largest and most productive of the farm.

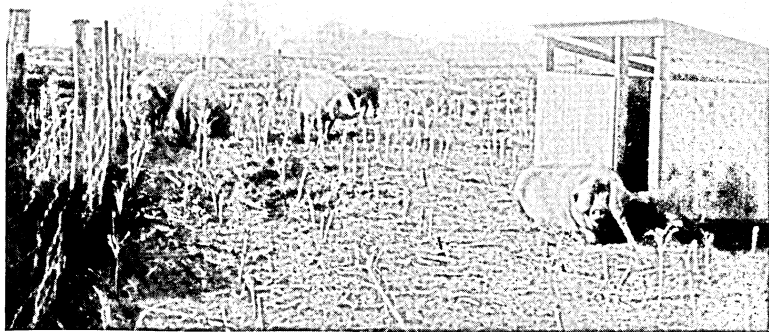
But the farm had no suitable accommodation for breeding stock and Mr. Abbott had to consider either erecting a range of piggeries in the traditional style or following an outdoor plan of shelters. Without hesitation he adopted the latter, because of its cheapness and because of its advantages to the soil. At first fixed shelters were tried on the permanent grassland and movable shelters on the arable crops, but owing to the risk of disease and to the poaching of the land, the permanent shelters on the grass were abandoned.

The plan of outdoor shelters for the sows did not entirely solve the difficulty of accommodation for farrowing sows. This, however, was most ingeniously and economically provided by building long, rectangular straw stacks at threshing time, running east and west. These were then fenced on their south side into suitable pens, and the sows burrowed under the stacks and made themselves dry and comfortable. The sows were kept in the straw-pens until a fortnight after farrowing, when they and their litters were moved out of doors to folding-pens in the fields.

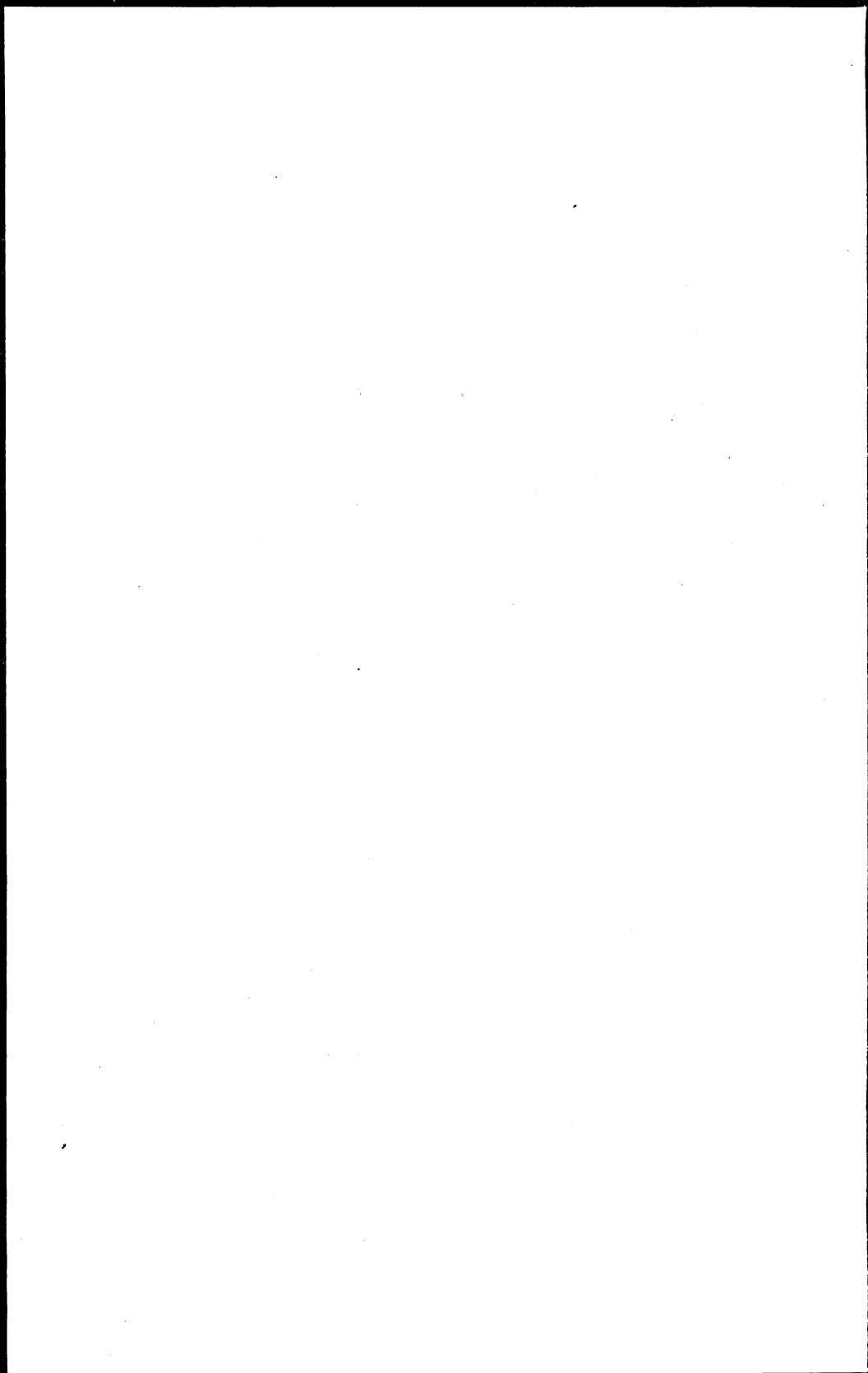
Except for the feeding pigs, all stock were maintained out of doors. They were folded on kale in the winter months and on tares and seeds in the summer months. At 16 weeks old the store pigs were brought into partly covered yards for



FARROWING-PENS IN STRAW STACKS. These stacks were 90 feet long, 12 feet wide, and 6 feet to eaves, and penned on their long side provided accommodation for 8 sows.



PIGS FOLDED ON KALE IN WINTER.



feeding, to be finished off at Midland pork weights, 8-10 stone (14 lb.) dead-weight.

Large Black sows have been found very suitable for folding, and when crossed with the Large White produce an excellent type of pig, which finds a ready sale. Since 1924 when the outdoor system was put into practice, the average number in litters from sows and gilts was 8.3 and the average number reared and sold was 7.0.

Poultry. During the period under review only a small farm-yard stock of poultry was kept.

Horses. The breeding of work-horses to meet the farm requirements was tried during the four years to 1921, but it did not prove a very satisfactory business.

In the following table, the progressive intensification of the live-stock departments of the farm during the first twelve years of Mr. Abbott's occupation is clearly shown.

TABLE I

Showing the live stock carried from 1917 to 1928 (as sheep equivalents)

<i>Year.</i>	<i>Cattle.</i>	<i>Sheep.</i>	<i>Pigs.</i>	<i>Poultry.</i>	<i>Total.</i>
1917-18	17*	33	1	..	51
1918-19	65*	53	4	..	122
1919-20	191	92	8	..	291
1920-1	129	110	17	1	257
1921-2	131	132	17	1	281
1922-3	148	137	15	1	301
1923-4	136	166	16	1	319
1924-5	199	167	55	1	422
1925-6	253	172	88	1	514
1926-7	200	195	110	1	506
1927-8	159	166	119	3	447

* Includes agisted cattle.

Maintenance of Fertility and Cleanliness.

The idea that the farm should be self-sufficing in the matter of feeding-stuffs was not regarded as a practical proposition, and live-stock developments proceeded on the assumption that it was at least as cheap to buy the foods as to produce them on the farm, and that the effect of purchases of food and manures was to increase the effective acreage of the farm as a means of maintaining a large head of live stock.

From the beginning, foods and artificial manures were bought on a liberal scale, and there can be little doubt that

they have been the means of adding to the fertility of the soil and of increasing the output of crops from the land. The value of the manurial residues of foodstuffs used and the expenditure on artificial fertilizers during the period under review were as follows:

TABLE 2. *Annual Value of Manures used on Farm*

	<i>3 years to 1919-20.</i>	<i>4 years to 1923-4.</i>	<i>4 years to 1927-8.</i>
	£	£	£
Manurial values of foods* . . .	67	87	199
Fertilizers purchased	162	138	133
	229	225	332
Per acre of arable land	17s. 9d.	17s. 6d.	25s. 4d.

* Excluding value of straw used as litter and the cost of carting and spreading manure.

The amount of artificial fertilizers purchased averaged just over 21 tons per annum, and the amount of manure carted out from the yards was approximately 700 loads per annum throughout this period. Fertility was also maintained by the grazing of sheep on seeds during the summer and the folding of root crops in winter. With the expansion of the pig department on an open-air system in 1924, this form of direct manuring of the land without the necessity for the dung-cart was much increased, and it is interesting to note that during the four years to 1927-8 the value of foods fed to stock on the land was approximately 44 per cent. of the total value of food used in that period.

Over the period, 30 per cent. of the farm-yard manure was applied to potatoes and sugar beet, 43 per cent. to fodder roots and forage crops, 22 per cent. to grain crops, and the remainder to mustard grown for seed. The use of artificial manures, after the first three years, was the same, the bulk of it being given to the root crops grown for sale and to fodder roots and forage crops, for Mr. Abbott considered that the residues of manures applied to root crops, and the folding of sheep, and later of pigs, was sufficient to secure satisfactory grain crops. No part of the land was farmed in this period with farm-yard manure alone or with artificials alone.

The cleanliness of the land was maintained mainly by preliminary cultivations and by intercultivation, where pos-

sible, during the growing season. Although not usually associated with this type of farming, fallows were necessary in the first two years, owing to the foul state of many of the fields. Fifty-eight acres were broken up by steam cultivation and fallowed, in 1917, and 18 acres were similarly treated in 1918. After this, cleaning was accomplished mainly through the root crops, though swedes and turnips, grown to provide feed for stock and to maintain cleanliness in the rotation, proved to be expensive for both purposes. Labour is the largest item of cost in growing cleaning crops, and it was found that kale, cabbage, and rape required less horse and manual labour than the orthodox root crops. The average saving was £1 1s. 5d. per acre on horse labour, 14s. 8d. on man labour, and £1 13s. 4d. on total costs, as compared with other roots.

A considerable acreage was cleaned and cultivated by potatoes and sugar beet. While it is true that the labour costs on these crops are high, they were profitable and imposed no burden on the succeeding crops.

On the grounds of economy Mr. Abbott preferred to do as much cleaning as possible before crops were planted. Because of its speed the tractor has been very useful for this purpose. Bastard fallows were taken, and immediately after harvest it became the practice to tractor-cultivate the stubbles, which did much to reduce the growth of annual weeds.

As the general result of the improvements to the land, the increasing use of fertilizers and the thorough cultivation, the yields of crops at Sacrewell rose considerably during the period under review, as the following figures relating to wheat, barley, oats, and potatoes, show:¹

TABLE 3. *Yields of Crops, 1918 to 1927*

<i>Crop.</i>	<i>1918 to 1920.</i>	<i>1921 to 1924.</i>	<i>1925 to 1927.</i>
	<i>Bushels per acre.</i>	<i>Bushels per acre.</i>	<i>Bushels per acre.</i>
Wheat . .	23·4	35·1	32·8
Barley . .	23·0	30·0	37·6
Oats . .	29·2	39·2	46·7
	<i>tons.</i>	<i>tons.</i>	<i>tons.</i>
Potatoes . .	4·1	5·2	5·4

¹ These are the only crops for which exact yields are available. Mr. Abbott considers that the increase in yields of lea and fallow crops is even greater than that of those crops shown in the table.

Manual Labour.

In a period when employment in agriculture was declining, it is interesting to find that on this farm a considerable increase in the use of labour took place. In 1918, 10 permanent hands were employed, and in 1928 the number was 18, an increase of 80 per cent. There was also more casual labour. Measured in wages per acre, the increase between 1918 and 1928 was 138 per cent., and it must be remembered that the rate of wages was considerably higher in 1918 than in 1928. Employment was fairly steady until 1924, after which an increase, both of permanent and casual hands, took place due to the expansion of the pig department and to the development of the sugar-beet crop after 1926.

In 1917-18 wages were equivalent to 37s. 4d. per acre and in 1927-8 to 88s. 11d. per acre. The high proportion of the cost of labour taken by crops is striking, amounting to nearly 61 per cent. over the whole period, while only 17 per cent. went in direct labour to live stock. The average expenditure on establishment was 13.5 per cent. which must be considered high, but was due to the many improvements effected during the time. In the first three years of the tenancy 69 per cent. of the wages went to crops and pasture, 8 per cent. to live stock, 6 per cent. to horses, and 17 per cent. to establishment. In the last three years of the period the proportions were as follows: crops and pasture 57 per cent., live stock 30 per cent., horses and tractors 3 per cent., and establishment 10 per cent.

Employment was greatest from July to November, when the harvesting of grain crops, potatoes, and sugar beet was in full swing. This seldom created any difficulty, as adequate casual labour was usually available and the work is not skilled. In the autumn as many as 15-20 casual workers might be employed. Casual help was also enlisted for haymaking, hoeing of roots, potato planting, couch gathering, and threshing. The number of casual hands employed not only increased but the period for employment tended to lengthen, especially after the sugar-beet crop was introduced. The average number employed and the average number of weeks' work for each rose from 14 men and 2.2 weeks in the first four years, to 23 men and 3 weeks in the last three years.

Whenever convenient, it was the practice to pay bonuses and piece rates, both to permanent and casual labour.

Bonuses were paid to men in charge of live-stock departments. The harvesting of grain, thatching, beet hoeing and lifting, potato planting, picking and riddling, manure carting, sheep dipping, and hedge-laying, were all set piecework to individuals or gangs.¹

Power.

The number of work-horses maintained on the farm, the average number of hours worked by each per annum, and the cost per working day during the period under review were as follows:

TABLE 4. *Cost of working horses and of horse labour, 1918-19 to 1927-8*

Year.	Number of Horses.	Total Number of Days Worked.	Days per Horse per annum.	Cost per Horse per annum.		Cost per Working Day.
				£	s.	
1918-19	8	1,965	245	51	6	4 2
1919-20	8-9	1,905	229	62	11	5 5
1920-1	8-9	2,122	259	60	6	4 8
1921-2	8	1,805	231	47	1	4 1
1922-3	7-8	1,523	198	32	8	3 2
1923-4	9	1,688	189	21	7	2 3
1924-5	8-9	2,053	232	28	5	2 4
1925-6	10-11	2,403	220	29	14	2 8
1926-7	11	2,796	254	29	4	2 4
1927-8	11-12	2,526	212	25	0	2 4

The increase in the number of horses after 1923-4 was due to the increase in live stock—particularly pigs—and later to the introduction of sugar beet which added considerably to the horse work, especially during the harvesting and carting of the crop. It will be noted that the cost per working day fell steadily, due to the reduction in wages and the cost of materials and foods, as well as to greater efficiency in management.

A Fordson tractor and plough was purchased in 1919 as an auxiliary source of power. The farm provides ample work, both field work and stationary belt work, to make a tractor profitable.

The tractor was used mainly for ploughing; it was also

¹ Bonuses and piecework rates paid in 1932 are shown in the Appendix, pp. 39-40.

used for cultivating, harvest work, grubbing up old hedges, grinding, sawing, &c. Belt work was discontinued after 1925, when the old water-mill was brought back into use. The tractor was most actively in use in the spring and during and after harvest for ploughing and cultivating. These were times of the year when horses were in greatest demand. The distribution of horse work showed that there were two well-marked peaks, one in March, April, and May, with spring cultivations and sowing, and the other in September, October, and November, with harvesting, autumn planting, potato digging, and root carting. The autumn peak of horse labour averaged nearly 50 horse-days per week, which was the full capacity of the horses employed, while the spring peak averaged 45 horse-days per week. During June and July only 30 horse-days were required per week. The tractor has therefore helped to keep down the number of horses. Not only so, but the speed of the tractor has enabled land to be prepared and sown under the most favourable conditions.

Mill. The water-mill, conveniently located in the middle of the farm near the buildings and stock-yards, is another source of power, reasonably cheap for grinding home-grown and purchased foodstuffs. Re-sale of foodstuffs bought in bulk and grinding of corn is done as a convenience for neighbours, but is not developed as a side enterprise.

5. *Efficiency of Management, 1917-28*

The tests which financial data supply of the efficiency of farming are the relationship of capital and labour to output, and the profit rate on the capital employed.

The Use of Capital and Labour.

Mr. Abbott's capital, taking his cash resources and the amount of the annual valuations made by the local valuers as the measure, naturally increased with the gradual increase of the live stock and the greater intensity of cropping. In 1917-18 the valuation amounted to £3,491, or £10 5s. per acre, and in 1927-8 to £6,517, or £17 12s. per acre. The latter figure indicates how heavily the farm was capitalized, especially when it is considered that the valuations represent commercial values only and are not inflated by pedigree values or by expensive equipment. Very few farms of similar size and type in the district were so highly capitalized.

TABLE 5. *Rate of Capital Turnover*

<i>Year.</i>	<i>Average Capital.</i>	<i>Total Receipts.</i>	<i>Time required for Capital Turnover.</i>	<i>Receipts per acre.</i>	<i>Wages Paid.</i>	<i>Receipts per £100 of Labour.</i>
	£	£	months.	£	£	£
1917-18	3,491	1,653	25·3	5	633	261
1918-19	4,078	2,061	23·7	6	927	222
1919-20	5,751	4,324	15·9	13	1,209	358
1920-1	5,934	4,022	17·7	12	1,386	290
1921-2	5,293	2,875	22·1	8	988	291
1922-3	5,244	2,847	22·1	8	803	355
1923-4	5,363	2,578	25·0	8	854	302
1924-5	6,010	4,618	15·6	14	1,041	444
1925-6	6,306	4,719	16·0	14	1,244	379
1926-7	6,347	5,629	13·5	15	1,543	365
1927-8	6,517	5,338	14·6	14	1,646	342

The relationship of the output to the capital employed showed much variation. Mainly owing to higher prices, output rose rapidly from £1,653 in 1917-18 to £4,324 two years later. As the capital had not increased in proportion, the rate of turnover was reduced from 25·3 months to 15·9 months. For the next four years the severe decline in prices caused the value of the output to fall, and the rate of capital turnover fell. Since 1923-4, however, output doubled, amounting in 1927-8 to £5,338 and the capital was turned over once in 14½ months. The improvement was due to rather better prices, to the larger output of crops, to the increase in the number of the pigs, and to the further extension of cash crops, such as potatoes and sugar beet.

In Table 5 the receipts per £100 of wages are also given. The figures again show considerable fluctuation, but it is clear that there was a better output per £100 of wages in the latter part of the period than in the earlier years.

Financial Results.

The ultimate test of Mr. Abbott's system of farming during this period, and of the developments he undertook, is the profit and loss account. It was an extremely difficult time for farmers, and prices fluctuated violently.

During the high-price period 1917-18 to 1919-20 good profits were made. In the slump which followed, in 1920-1, 1921-2, and 1922-3, severe losses were incurred, but in the period of relatively stable values from 1923-4 to 1925-6 the

returns were again good, only to fall again in the following two years.

The profit and loss figures were as follows:

TABLE 6. *Profit and Loss Accounts, 1917-18 to 1927-8*

Year.	Profit+	Per cent. on Capital.	Per acre.
	Loss—		
	£	per cent.	s. d.
1917-18	+ 971	+28.0	+57 3
1918-19	+ 834	+24.5	+43 3
1919-20	+1,433	+24.9	+85 1
1920-1	— 883	—14.9	—52 1
1921-2	— 575	—10.8	—34 0
1922-3	— 281	— 5.3	—16 7
1923-4	+1,062	+19.8	+62 8
1924-5	+ 504	+ 8.4	+29 9
1925-6	+ 757	+12.0	+44 8
1926-7	— 60	— 0.9	— 3 6
1927-8	— 515	— 7.9	—27 3
Whole period	+3,248	+ 5.8	+17 3

Over the whole period a profit of £3,248 was made, which was about 5.8 per cent. on the average capital employed. The first six years to 1922-3 left a profit of £1,499, or £250 per annum, and the remaining five years one of £1,749, or nearly £350 per annum. The return on capital in each period was approximately the same.

The total profit realized during the eleven years came mainly from crops. These amounted to £4,155. On all live stock there was a loss of £873 and on sundry items a small loss of £35.

The contributions of the various live-stock departments of the farm to the profit and loss in each year are shown in the following Table:

TABLE 7. *Profit and Loss on Live Stock, 1917-18 to 1927-8*

Year.	Horses.	Cattle.	Sheep.	Pigs.	Poultry.	All Live Stock.
	£	£	£	£	£	£
1917-18	+ 12	+ 54	+ 51	+ 11	..	+128
1918-19	-175	— 13	+ 19	+ 76	..	— 93
1919-20	— 58	+239	+198	+102	..	+481
1920-1	-115	-293	-155	— 31	..	-594
1921-2	+ 10	-178	— 93	+ 43	..	-218
1922-3	— 45	-140	+ 71	+ 28	..	— 86
1923-4	— 45	-200	+179	+ 4	..	— 62
1924-5	0	— 95	+ 46	+ 80	..	+ 31
1925-6	+ 5	-300	— 55	+657	..	+307
1926-7	— 55	-329	— 16	+153	..	-247
1927-8	— 47	-134	+ 21	-403	+ 43	-520
All years	-513	-1,389	+266	+720	+ 43	-873

In the main departments, cattle showed a profit in two years out of eleven, when cattle were taken in for agistment. Sheep, on the other hand, left a profit in seven years and incurred a loss in four years. Pigs were the most consistent profit-makers among live stock, losses being incurred only in 1920-1 and 1927-8.

The amounts contributed by the various crops to the profit and loss account are shown in Table 8:

TABLE 8. *Profit and Loss on Crops, 1918 to 1927.*¹

<i>Year.</i>	<i>Wheat.</i>	<i>Barley.</i>	<i>Oats.</i>	<i>Potatoes.</i>	<i>Clover Hay.</i>	<i>Fallow Crops.</i>	<i>Others.</i>	<i>All Crops.</i>
	£	£	£	£	£	£	£	£
1918	+307	+92	-140	-14	+80	-68	+399	+656
1919	+93	+437	-4	+156	..	-17	+256	+921
1920	+224	+368	-32	+359	+75	-143	+75	+926
1921	+260	-120	-6	-145	-34	-153	-71	-269
1922	+95	-6	-36	-312	-3	-163	-125	-550
1923	-69	+49	-54	+337	+5	-90	..	+178
1924	+658	+261	+37	+297	+32	+5	+76	+1,366
1925	+302	+4	..	-70	..	-71	-150	+15
1926	+169	-13	..	+111	..	+376*	-32	+611
1927	-64	+193	+45	-10	+5	+4*	-115	+58
All years	+1,975	+1,265	-190	+709	+160	-320	+313	+3,912

* Sugar beet.

Wheat left a profit in eight years and incurred a loss in only two years. Barley was profitable in seven years, while potatoes showed a balance on the right side in five out of the ten years. The profits of the successful years with potatoes outbalanced the losses on the unsuccessful years by £709 on a total acreage of 183 acres.

A comparison of the returns from the live-stock departments with those from the crop departments makes it quite clear that the easy generalization that 'England is a live-stock country' has no application at Sacrewell.

The profit on the farm as a whole does not represent a high return on the capital invested, especially when it is remembered that profit had to cover the services of management, for which no charge was made, though against this must be set the use, by Mr. Abbott, of the farm-house free of rent and rates. Further, there had been a large expenditure on permanent improvements to the farm, all of which was met from revenue. The farm at the end of the period was in a much

¹ In Tables 6 and 7 the figures refer to the eleven financial years, which commenced at Michaelmas. In this Table the figures are for ten years only, and the figures for each year refer to the crop grown in that year.

more fertile condition than at the beginning of the tenancy. It was clean; the lay-out had been much improved; the fences and the hedges were in excellent condition; the drainage had been improved and was satisfactory, and improvements had been made to buildings, roads, and so on.

In operating his farm during this period, Mr. Abbott followed certain principles. The first was to make adjustments in the lay-out to permit of economical working and to avoid waste of time and effort. All the improvements in hedging, draining, and road-making were directed to this end. The second was to test his various enterprises by financial results, and from the experience gained to expand, contract, or modify his farming policy. The increase in the number of pigs kept, the reduction of the area of fodder roots and their replacement by cheaper substitutes, and the further extension of cash cropping, as in sugar beet, are examples of Mr. Abbott's readiness to change when conditions required it. The cattle were the only form of live stock which were consistently unprofitable, but they were regarded as indispensable to consume summer grass and a certain amount of roots, hay, and straw, for all of which an outside market could not be found. This reliance on book-keeping, the basic science of farming, as a guide to the policy to be pursued is both rare and notable.

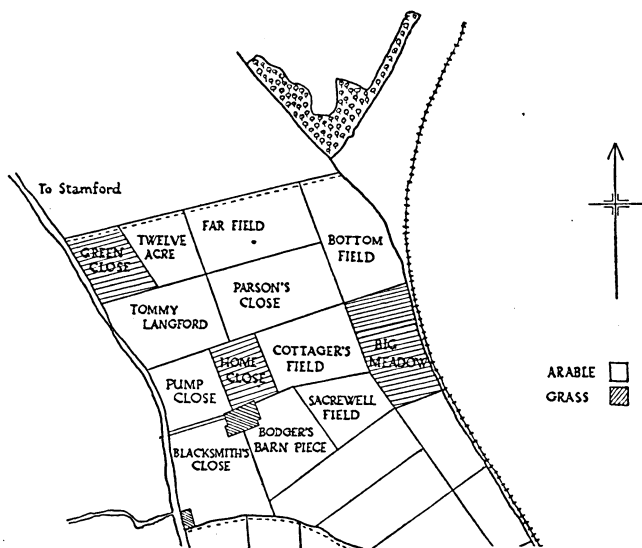
Considering the state of the farm when he took it over, Mr. Abbott also believed that it would be profitable to increase output. This he did by adding to the live stock and by manuring for higher crop yields. At the same time, by growing more cash crops, and by adjustments amongst the different classes of live stock, he quickened the rate of his turnover, which was important in a period of declining prices.

Lastly, it was Mr. Abbott's object, even in this first period of his farming, to make each branch of the farm profitable in itself, even though some might be partly interdependent, and all of these measures met with a fair measure of success in a difficult time.

III. THE SECOND PERIOD, 1928-9 TO 1931-2

At Lady-day 1929, Sacrewell Lodge Farm, adjoining Mr. Abbott's farm on the north, became vacant and he took it, working it with the other as one unit, under the same conditions of tenancy. The new farm extended to 233 acres, of

which 184 were in arable cultivation, so that altogether he was now in occupation of 593 acres of which 440 acres were plough-land. The soil on the new farm was similar to that of the old, being mainly stone brash of no great depth. The lay-out was excellent. There were 13 fields of good shape, varying in size from 9 to 23 acres.



The *immediate* effect of taking over the new farm was to spread labour and capital over a larger acreage. The numbers of live stock and the labour cost of working the two farms remained about the same as previously. The valuation rose only by £1,008, viz. from £6,517 in 1927-8, which was equivalent to £17 12s. per acre on the 370 acres then occupied, to £7,525 at Michaelmas 1929, which was equal to £12 14s. per acre on 593 acres. In other words, the additional land was capitalized at approximately £4 10s. an acre, mainly represented in crops and cultivations.

Since 1928-9 a process of development has taken place. The dairy herd which was introduced in place of store cattle has been increased to 35 cows. The ewe flock was raised to 200 ewes in 1932, and the poultry, which hitherto had occupied only a minor part in the farm economy, has been gradually increased to 1,000 laying birds. Corresponding with these increases, the valuation rose to £8,345, being equal to £14 1s.

per acre. At the same time, labour costs rose to nearly £2,300.

The new farm was very dirty and impoverished, but a very dry year was a great help in getting the land cleaned,¹ although doing nothing for the yields of crops, which were very meagre indeed. In 1929 and 1930 the yields from the combined farms fell considerably from the high standard which they reached on the first farm.

1. *Reorganization of Live Stock and Cropping*

The importance of the second period of Mr. Abbott's farming, following the taking over of Sacrewell Lodge, lies in the complete reorganization of the live stock and cropping policy which he undertook. His previous experience had led him to new ideas of farm management, and the new farm gave him the opportunity to put them into practice. Up to 1928 when times were comparatively easy the changes which were made consisted essentially of modifications of the established local practice. After that date, under the stress of much less favourable conditions, the modifications were more drastic in character and amounted to a real departure from the traditional system of farming.

The chief innovation now introduced consisted of the segregation of the different classes of live stock into departments, each occupying a definite portion of the farm and each being more or less watertight and independent. Coupled with this, a new method of cropping was also planned for each department, rotations being devised to provide for the needs of the live stock concerned and for the maximum of cash cropping. In each department the scheme provided for the direct application as far as possible of animal manure to the soil.

In the labour organization of each branch of the farm, the aim was to provide full-time work for every man concerned. There was to be no coming and going of labour between one department and another which could in any way be avoided. This specialization made for efficiency in the workers and simplified the problem of control.

The organization now adopted involved a departure from general mixed farming methods and the four-course rotation which had hitherto been practised by Mr. Abbott. Yet the

¹ Three good coats of twitch were taken off most of the arable fields on the new farm.

new plan did not involve the sacrifice of any of the products previously sold off the farm. It simply rationalized their production in accordance with the needs of the times.

Four live-stock departments were set up under the new plan: (1) Pigs, (2) Dairy herd, (3) Poultry, and (4) Sheep and Store Cattle.

Pigs.

Dealing first with the pigs, Mr. Abbott's success during the early years of the first period on Sacrewell Farm led to the expansion of this department in 1924. Apart from the improved farrowing pens which have already been described, portable huts and equipment were used on parts of the permanent grass in summer, and on the kale crops in winter. This was not altogether satisfactory, first, because the area used for the purpose was too limited and became quickly infested with parasites; second, because the corn following the roots, where the pigs had been, was over-manured and went down; and third, because of the waste of the manurial residues of the highly concentrated foods fed to the pigs.

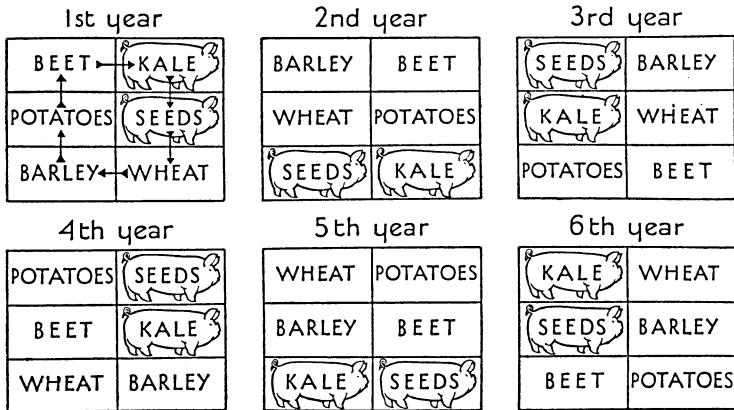
When the Lodge Farm was taken over in 1929, Mr. Abbott decided to transfer the pigs to it and to carry out a scheme, which had been long in mind, of keeping the pigs on a particular section of the arable land, under a definite scheme of cropping. There was a compact area of 82 acres suitable for this purpose (see map on p. 35), and the following rotation was adopted:

Kale or cabbage (folded by pigs).
Sugar beet.
Barley or wheat.
Seeds—mixed clovers (folded by pigs).
Potatoes.
Wheat.

The principle of the system is to develop intensive pig production on the land without the expense of littering, dung-carting, and loss of manurial value in dung-making, and to exploit the food residues by the growth of saleable crops. The system provides a summer- and winter-folding crop for the pigs,¹ and, following each folding, a cash root crop is taken which utilizes

¹ The kale may be omitted entirely. Sugar-beet tops provided excellent fodder for the pigs from October 1932 until the end of January 1933. After that the surplus of savoys grown for sale was utilized as winter fodder.

the bulk of the manurial residues. As the land is left clean after these crops, they are each in turn followed by a cash grain crop, which does not suffer from lodging as when taken directly after the folding. This specialized pig-and-crop department is planned as shown in the accompanying sketch,



and the system works out neatly, the pigs following round, both root crops and both corn crops coming together.

Roughly, 50 sows can be run on 100 acres on this system, one-third of the area being used for fodder crops for the pigs and the remainder for sale crops. The advantages are:

1. Land is pigged once in three years only, which should lessen the danger from parasites.
2. There is not so much risk of disease, as the stock are scattered.
3. The breeding stock have plenty of air and exercise, and the young pigs are hardy and have good constitutions.
4. The manure is deposited directly on the land.
5. Low capital costs compared with the provision of permanent buildings.

The chief disadvantages are having to cart food and water, having to move pens, and the labour of fencing. Food is carted out from the mill, twice a week, by the horses when going to the fields on the new farm, so as to save a special journey. The carting of water is not difficult, for the land is near the farm buildings and the water-supply of the new

farm. The rotation plan of cropping is also designed to avoid moving of fencing and houses over long distances.

The general system of management of the pigs is as follows. About a week before farrowing the sows are brought in from the folding-pens in the fields to farrowing-pens at the buildings; a week or so after farrowing two or three sows and their litters are turned into a yard, the number depending on the size of the litters, about 20 small pigs being put together. When they are 3 or 4 weeks old and the sows and litters have settled down together, they are moved out to a hut in one of the folding-pens. At 8 weeks the pigs are weaned, and being in familiar surroundings they suffer very little check. They are then treated for worms and moved to a fresh pen. After a further period of about 12 weeks in the fields, the young pigs are brought into a yard at the farm buildings to be fattened. This usually takes about a month, so that the pigs should be and are ready for sale at 24 weeks old when they average 12 stone live-weight. The range of weights is from 150 lb. to 200 lb. live-weight, and of the ages at sale is from 21 to 27 weeks. Rather smaller weights are turned out during the summer months and heavier pigs in winter.¹ The sows, which now include some of Welsh White breed, are run out till they farrow again, usually following on the land behind the stores.

The pigs are under the charge of a full-time man.

Dairy Herd.

Coming now to the cattle, Mr. Abbott's experience during the first period was that the returns from the rearing and feeding of cattle were consistently bad, and when the Lodge Farm was taken over he decided to change to dairying. A small beginning had been made in 1926, and with the extra land the idea once more was to departmentalize, keeping the milking cows at the Lodge Farm and rearing the young stock at Sacrewell. The buildings at Sacrewell, vacant owing to the moving of the pigs, were quite suitable for stock rearing, while those at the Lodge Farm were unsuitable for anything without alteration. Their chief advantage was that they had easy access to the high road.

As no dairying had been practised previously at the Lodge

¹ The amount of *concentrated* food used, including that used for the sows, has been rather less than 5 cwt. per pig sold, which testifies to the economy of feeding under this method.

Farm, it was necessary to provide a cow-shed and a water-supply. The former was made by the conversion of part of a barn, into nine standings, at a cost of £125. The method in operation has some features of the open-air bail system, as the cow-shed is used only as a place for milking and for feeding concentrated foods, and nine standings suffice for 35 cows. A partly covered yard, having access to the cow-shed and to the pasture, is used for holding the cows during the milking period, for housing them at night in the winter, and for feeding hay and other fodder. Straw is plentiful and is used liberally as bedding. The water-supply was obtained by a ram from the 'Sacrewell' spring which, it is believed, gives the name to the place. The total cost of providing water was £125.

When dairying was begun in 1926 cream was sold locally. When, however, the preservative order came in, and with it the use of emulsifiers for the production of synthetic cream, the market was lost, and a milk contract was obtained with the local co-operative society. It was terminated in the spring of 1930, and after much thought Mr. Abbott decided to enter the retail trade, selling *graded* milk locally and in a neighbouring town where there was no supply. The Lodge Farm seemed suitable for producing graded milk because the pasture was all isolated by arable land, the scheme of departmentalization kept the cows from contact with other stock, and the water-supply, coming from springs, was self-contained. At the same time, the additional land taken over in 1926, which is completely isolated from the two main farms, was convenient for taking any reactors until they could be disposed of.

This new undertaking involved further capital expenditure. A loose-box was converted into a dairy at a cost of £33. Dairy equipment, including cooler, bottling plant, washing plant, sterilizer, cans and bottles, &c., cost £227, and a delivery van and motor-cycle combination were purchased, together costing £207 10s.

The cows were tested, and retailing was begun in July, 1930. The amount sold was 16 gallons daily, the surplus being made into butter. Of the quantity sold 6 gallons were disposed of at Grade A (T.T.) prices and the remainder at ordinary milk prices. In the spring of 1932 the supply of graded milk to schools was undertaken. Altogether 60 gallons of milk are now disposed of daily, of which 17 gallons are sold as graded

milk, 20 gallons as 'school' milk, and the remainder as ordinary milk.

Apart from the difficulties of marketing, the building up of a tubercle-free herd has also presented its problems. In the first test about one-third of the cows failed to pass. In the second test again about one-third failed. When, however, the results of this test were sent to the Ministry of Health a re-test was considered necessary. This was duly carried out and finally there was only one cow left in the herd which was considered to be free from disease. Subsequent tests have been as satisfactory as could be expected, bearing in mind the fact that cows have had to be imported to increase the herd.

Mr. Abbott's difficulties and the costs which have been incurred by him in replacing stock appear to be due to no fault of his own but to the different interpretations which veterinary officers place on the evidence of the tests. If his experience is common, it would seem essential that a service of veterinary officers engaged full-time on this work should be provided, so as to ensure greater uniformity of practice and to act in an advisory capacity to farmers operating graded milk schemes.¹

The general policy of the herd management is to raise all the heifer calves and, in time, to keep the herd up to strength entirely with home-bred stock. In this way the risk of infection from outside, and the high cost of buying-in stock for replacement purposes, will be avoided.

At the present time the herd numbers 35 head of Dairy Shorthorn cows. Like the pigs, they have their own section of the farm, an area of 169 acres of land at the Lodge Farm having been set aside for them. This comprises 54 acres of arable land, 74 acres of temporary grass and 41 acres of permanent pasture (see map on p. 35). It is not fully utilized by the cows, 41 acres of the arable being under grain crops which have no association with the herd. The remaining 13 acres of arable is in lucerne, grown for the cows as an insurance against drought.

No definite scheme of cropping has yet been laid down for this land, for the final number of cows necessary for the business is not yet determined. It is not certain whether the

¹ See Mackintosh, 'Eradication of Tuberculosis from Cattle Herds', *R.A.S.E. Journal*, 1931, vol. xcii, p. 57. Since the above was written, the Reorganization Commission for Milk has recommended the institution of a veterinary service.

permanent pasture will be retained, and present intentions favour a system of long leys followed by cash crops to use the manure provided by the herd. Mr. Abbott has in mind a rotation of four fields, one of which will be in lucerne for hay and soiling in drought, one in seeds mixture, consisting of indigenous cocksfoot, smooth-stalked meadow grass, and wild white clover, and the remaining two fields in crops for sale. The lucerne and seeds mixture should stay down for 5 years.

The cows and dairy, together with the retail round, provide full-time employment for four men and a youth.

Poultry.

As poultry had proved generally profitable, Mr. Abbott decided, in 1930, to increase their number to make full-time work for one man. The new stock turned out to be badly affected with fowl paralysis, and an entirely fresh start had to be made in 1931, commercial Rhode Island Reds being selected.

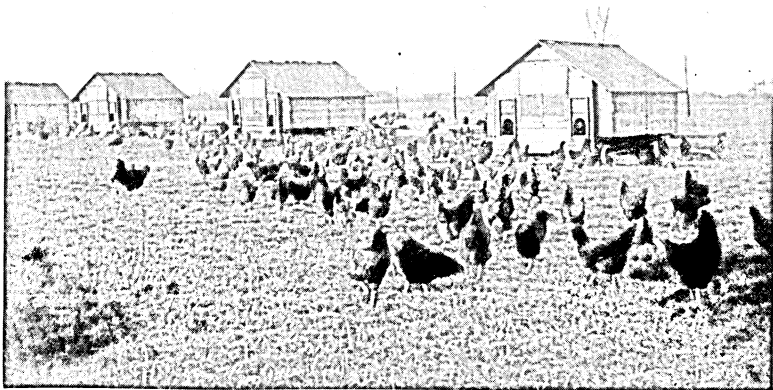
The laying flock was first of all housed in laying-houses,¹ holding just over 100 birds each, on the pastures near to the house and buildings on Sacrewell Farm, but there were several disadvantages to this system. First, there was the difficulty in placing houses sufficiently far from the arable fields and the rick-yards; second, there was a very uneven distribution of manure and fouling of the pastures; third, losses from foxes were severe, birds being taken even in day-time; and lastly, there was always the possibility of spreading disease amongst the cattle.

To obviate these, it was decided to keep the poultry on arable land in movable slatted-floor houses, each holding 60 birds, surrounded by a pen of wire netting. The houses are moved weekly and the wire-netting pen every six weeks or so. Once more the policy of allocating land to the department was followed, 47 acres of arable land on Sacrewell Farm being set aside to be cropped with a two years' ley followed by two years' corn (see map on p. 35). The poultry run over about one-quarter of this area annually. They go on the new seeds in June and remain about a year—any surplus herbage being mown or grazed by sheep. The seeds are broken up after a hay crop has been taken and bastard-

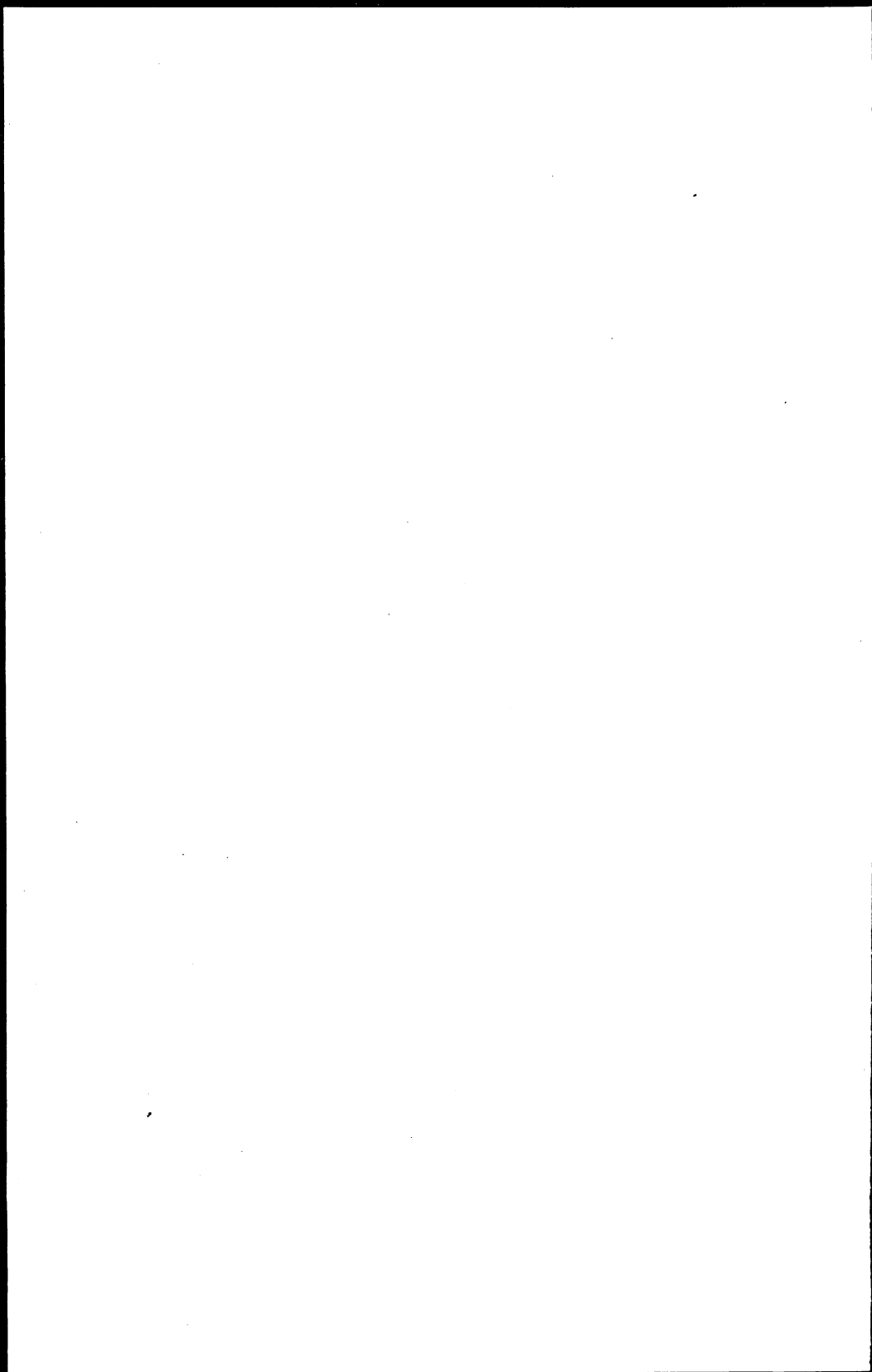
¹ These have now been converted into brooder houses.



THE POULTRY UNIT, A GENERAL VIEW. Slatted-floor houses, each holding 60 birds, are used.



A VIEW OF THE LAYING STOCK (Rhode Island Red).



followed, if necessary, towards the end of the second year, and are followed by two corn crops.

The flock comprises about 1,000 birds, the rate of stocking being about 2,000 birds to 100 acres of land.

This system appears to have the following merits. The poultry are kept on fresh ground each year. The manure is distributed to advantage and the land is heavily manured—residues from approximately 4 tons of food to the acre being applied to the 12 acres folded each year. The poultry have the advantage of what is almost free range.

On the other hand, there is slightly more labour in setting fencing. The system, which yet remains to be proved a financial success, suggests a hopeful method of farming poorish, light, arable land under a corn and seeds rotation, as no manuring or manure-carting is necessary, the seeds providing the humus and the hens the manure.

The present plan for recruiting the laying flock is to buy day-old chicks from one of the poultry stations accredited under the scheme of the Ministry of Agriculture. This should be a guarantee that the stock are good and free from disease. Later, when the financial returns from the scheme are more clearly seen, an investment in incubators may be advisable so as to raise the stock on the farm.

Sheep and Store Cattle.

The pigs, dairy herd, and poultry together account for 298 acres. The remainder of the two farms, amounting to 183 acres of arable and 64 of permanent pasture on Sacrewell Farm, is reserved for the sheep and the young cattle stock from the dairy herd. The rotation, adopted in 1931, for farming the arable portion of this area is beet, barley, seeds (3 or 4 years), wheat, wheat. A small area of mangolds is grown in the root break for the sheep. Besides the 11 work-horses maintained on this area, 40 head of young cow stock and 200 ewes and their lambs are carried, and a shepherd is responsible for the management of both sheep and cattle. As the root break is now confined mainly to saleable crops, the flock of Oxford Downs has been sold. While the returns from the Down flock had been reasonably satisfactory, it entailed growing a considerable acreage of kale, and the fold was responsible for some late-sown crops of barley, which were often unsatisfactory. So, in the autumn of 1931, a complete change to half-breds was made, and these are run on beet

tops in early winter until taken off for lambing in January, when they have mangolds on the grass and seeds, thus avoiding all fodder roots except 5 acres of mangolds.

In 1932 there was an excellent fall of lambs from the half-breeds, considerably better than that previously obtained from the Oxfords. From 60 theaves put to a Suffolk ram, 103 lambs were weaned, which was equal to a fall of 171 per cent. From 96 lambs put to a Southdown ram 94 lambs were weaned which was equal to 98 per cent. Losses were inconsiderable. Two theaves were lost prior to lambing, one at lambing and one subsequently, while there was only one barren. Of the lambs mated, 2 were lost after lambing and 5 were barren. The theaves lambed in March and the lambs in April. Of the progeny, 16 were sold fat in June, 32 in September, and since then there has been a regular sale of fat lambs from the grass and beet tops. Mr. Abbott's intention, however, is to get the majority of the lambs sold before the bulk of the grass lambs come into the market, and in 1933, as the result of earlier lambing, sales are expected to commence in May.

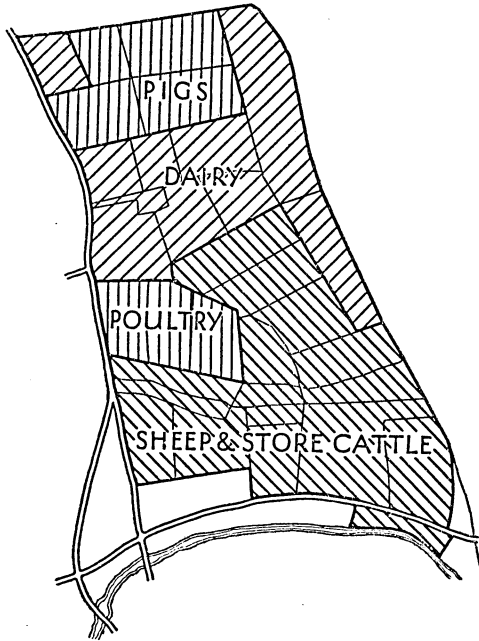
The lay-out of the two farms for the four main departments is shown on the accompanying sketch, and the plan of cropping is as follows:

TABLE 9. *Plan of Cropping*

Department.	Total Acres.	Per- manent Grass.	Arable.	Rota- tion.	Cropping of Arable.			
					Grain.	Beet and Potatoes.	Tem- porary Grass.	Fodder Roots and Kale.
		acres.	acres.		acres.	acres.	acres.	acres.
Pigs . . .	82	0	82	6 course	28	27	13	14
Dairy . . .	169	41	128	?	41	23	64	..
Poultry . . .	47	0	47	4 course	23	..	24	..
Sheep and Store Cattle	247	64	183	8 course	70	17	91	5
	545	105	440	..	162	67	192	19

It will be seen that the area of fodder roots and kale has been reduced to less than 5 per cent. of the total arable land. The area of temporary grass is about 44 per cent. of the total, and the remainder is under saleable crops of grain and roots. The plan is based on a faith in the possibility of profitable corn-growing if the use of expensive fodder root crops for cleaning the land, and the equally costly dung-cart, be reduced to the minimum. The stock and land systems are independent of one another, except that the

sheep may graze the poultry seeds or the young cattle the rough grass for the sheep. Each of the schemes is of sufficient size to have its own full-time and experienced labour staff, but they have a common service in the horse-men, horses, tractor, and the mill. The number of work-



horses has been reduced from 14, to 11 now that all road work is done by a motor lorry and haymaking is mechanized by means of a tractor hay sweep. The movement of large quantities of beet and potatoes, the transport of large numbers of pigs and sheep, and the haulage of grain and feeding stuffs was too slow a process by horse work, and the motor lorry is a decided advantage and an economy.

2. *Financial Results*

Conditions in agriculture have not been good since the new farm was taken over. Except for pig prices in 1929 and 1930, the trend for all agricultural produce has been downwards. To build up a new system in the face of such circumstances signifies a faith in the future and involves taking

a long view. The profit and loss accounts of the combined farms during the latter period of Mr. Abbott's farming show the following results:

TABLE 10. *Profit and Loss Accounts, 1928-9 to 1930-1*

<i>Year.</i>	<i>Dairy Cows and Cattle.</i>	<i>Sheep.</i>	<i>Pigs.</i>	<i>Poultry.</i>	<i>All Live Stock.</i>
	£	£	£	£	£
1928-9	-211	- 75	+ 72	+ 72	-142
1929-30	-296	-125	+245	+ 71	-105
1930-1	-312	-466	+358	-131	-551
All years	-819	-666	+675	+ 12	-798

<i>Year.</i>	<i>Wheat.</i>	<i>Barley.</i>	<i>Sugar Beet.*</i>	<i>Potatoes.</i>	<i>Other Crops.</i>	<i>All Crops.</i>	<i>Farm Total.</i>
	£	£	£	£	£	£	£
1928-9	+55	+112	+217	- 67	+ 61	+ 378	+236
1929-30	+11	..	+241	..	+ 23	+ 274	+169
1930-1	-98	+ 47	+508	+313	+141	+ 912	+361
All years	-32	+159	+966	+246	+225	+1,564	+766

* After crediting the beet crop with the value of manurial and cultivation residues and tops to the extent of £188 in 1928-9, £282 in 1929-30, and £321 in 1930-1.

Despite the adverse trading conditions, moderate profits were made, representing 3.6 per cent. on the capital valuation in 1928-9, 2.2 per cent. in 1929-30, and 4.3 per cent. in 1930-1. While it is too early to say that the reconstruction of the farming system has justified itself, it may be noted that these results followed two unsuccessful years under the old system (1926-7 and 1927-8), when the price level was considerably higher.

All of the live-stock departments were being reorganized during the three years to 1931, and only the pigs made a satisfactory showing. Good reasons can be given for the adverse results with the dairy cows and the poultry. Both were in a process of building up and, in consequence, expenditure on equipment and on labour had to keep ahead of production. In other words, there is a lag between the expenditure and the returns which may be expected from these departments when they are in full running order. Further, a very heavy expense was involved in building up a tubercle-free herd. The large number of cows which

failed to pass the test meant a considerable loss on sale and replacement. Further, in 1929-30 and 1930-1, the cost of tuberculin-tested milk was being incurred when only a very small portion was being marketed as such. The all-in cost of production and delivery in these two years was 16.65*d.* and 17.84*d.* per gallon respectively, while returns were only 12.15*d.* and 13.74*d.* per gallon. In poultry, also, there was in 1930-1 a serious loss of birds through disease imported with the purchased stock, and a consequent loss in egg production.

Nevertheless, the income from these two departments is increasing rapidly. In the dairy, receipts rose from £719 in 1929-30 to £1,033 in 1930-1 and to £1,610 in 1931-2. In poultry, the income which was £323 in 1930-1 has increased to £470 in the following year.

The heavy loss in sheep in 1930-1 was mainly accounted for by the slump in prices. During the year Mr. Abbott was changing over to the half-breds, and he was caught with double his usual number of sheep on a rapidly falling market. The Down ewes realized almost £1 a head less than their value at the beginning of the year, and the half-breds had to be written down at the end of the year by 7*s.* a head compared with the purchase price.

The profit and loss accounts represent results during the transitional stage from the old to the new system of farming, while experience was being gained of the new farm. The figures, though by no means impressive, are on the whole hopeful, and given a period of stability Mr. Abbott has every belief that they will ultimately prove satisfactory.

After a visit to a farmer friend in Norfolk in April 1931, he wrote: 'I was much interested in the different means by which farmers were trying to overcome their difficulties. My friend was farming on the traditional system, except that he had replaced half his roots with beet. Up to the present he has done quite well. Within a few fields was X with tractors and combines and a couple of men on a 1,000 acres, and another near neighbour had put his entire holding down to grass. It was rather sad to see the empty cottages. Yet another neighbour was growing nothing, but selling off crops—potatoes, carrots, beet, and milk. It will be interesting to see how they all fare.'

Mr. Abbott's system of farming has points of relationship to all of these ideas. He has cut down his expensive fodder

root crops; he has applied mechanization to the growing of his crops and the handling of them at harvest; he has laid down—temporarily at any rate—parts of his farm to grass for his stock, and he has developed the practice of growing crops for sale. It is, however, by reason of the departmentalization of the live stock, the specialization of labour, and the intensification of production that Mr. Abbott has made a contribution to constructive action in farming to-day, and that he takes his place with other successful farmers whose methods have been described in this series of pamphlets. Mr. Abbott now employs a capital of over £8,300 on 593 acres; wages are paid to the amount of £2,300 per annum, and the rent is £686 for what would be regarded as a farm of moderate quality. It is interesting to note, also, that there are 7 men employed, excluding milk-roundsmen, each of whose wages exceed £100 per annum.

Mr. Abbott has been farming in a district where estates have been broken up and many farms are unlet to-day. These disturbing influences, while they may have led to uneasy moments, have never turned him from his purpose of improving the farms under his charge in every way, and of seeking the means by which to adapt his policy to changing circumstances in a spirit of self-reliance and determination.

APPENDIX

1. Cropping of Arable, 1918 to 1927.

<i>Crop.</i>	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.
	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>	<i>acres.</i>
Clover and Rye-grass	33	..	33	41	52	45	36	41	30	59
Sainfoin . . . . .	..	..	..	..	22	22	27	..	..	..
Beans or Peas	19	15	15	..	..	..	..	..	..	..
Mixed crops	15	19	36	38	19	..	..	26	..	..
Wheat	39	36	57	68	67	81	84	87	67	63
Oats	15	35	19	17	5	18	18	22	15	16
Barley	31	70	41	32	45	17	41	16	18	38
Flax, Mustard, Tares, &c.	39	24	17	..	..	..	10	15	49	20
Mangolds	5	5	5	5	5	5	6	7	7	7
Swedes and Turnips	33	40	14	34	12	48	11	14	17	..
Kale, Rape, Cabbage, &c.	..	..	..	..	..	..	18	20	17	16
Bare fallow	18	..	..	..	..	..	..	..	..	..
Potatoes	12	15	22	22	27	18	14	17	15	21
Sugar beet . . . . .	..	..	..	..	..	..	..	..	29	30
	250	259	259	257	254	254	264	264	264	270

2. Bonuses and Piecework Rates in 1932

BONUSES

Pigman. 3*d.* for each pig sold fat (and wages 40*s.* a week and free house).

Poultryman. 4*d.* per 100 eggs (and wages 35*s.* a week). This induces the poultryman to keep up the stock to the maximum of his capacity and to get a high production per bird.

Shepherd. 6*d.* per lamb for all weaned or sold before weaning. (Wages 36*s.* a week and free house.)

Cowman. 2*s.* 6*d.* a calf. This is a commuted payment for overtime during calving. Wages 42*s.* a week and free house.

Milk-roundsman. 1*d.* per gallon of milk sold. This covers bad debts and bonus for getting customers and keeping them on his books.

Miller. 6*d.* a ton for all food going through mill. (Wages 32*s.* 9*d.* a week.)

Tractor Driver. 2*d.* per ton for lorry work ; ploughing, 6*d.* an acre ; and some cultivating, 2*d.* an acre. (Wages 30*s.* a week.)

PIECEWORK RATES. (Subject to adjustment according to conditions.)

Potato setting. 7*s.* an acre.

Potato hoeing. 8*s.* an acre.

Beet singling and hoeing. 35*s.* an acre. (Singling and one hoeing.)

Manure carting. 6*s.* a score of loads for filling.

Sheep clipping. 5*d.* per fleece.

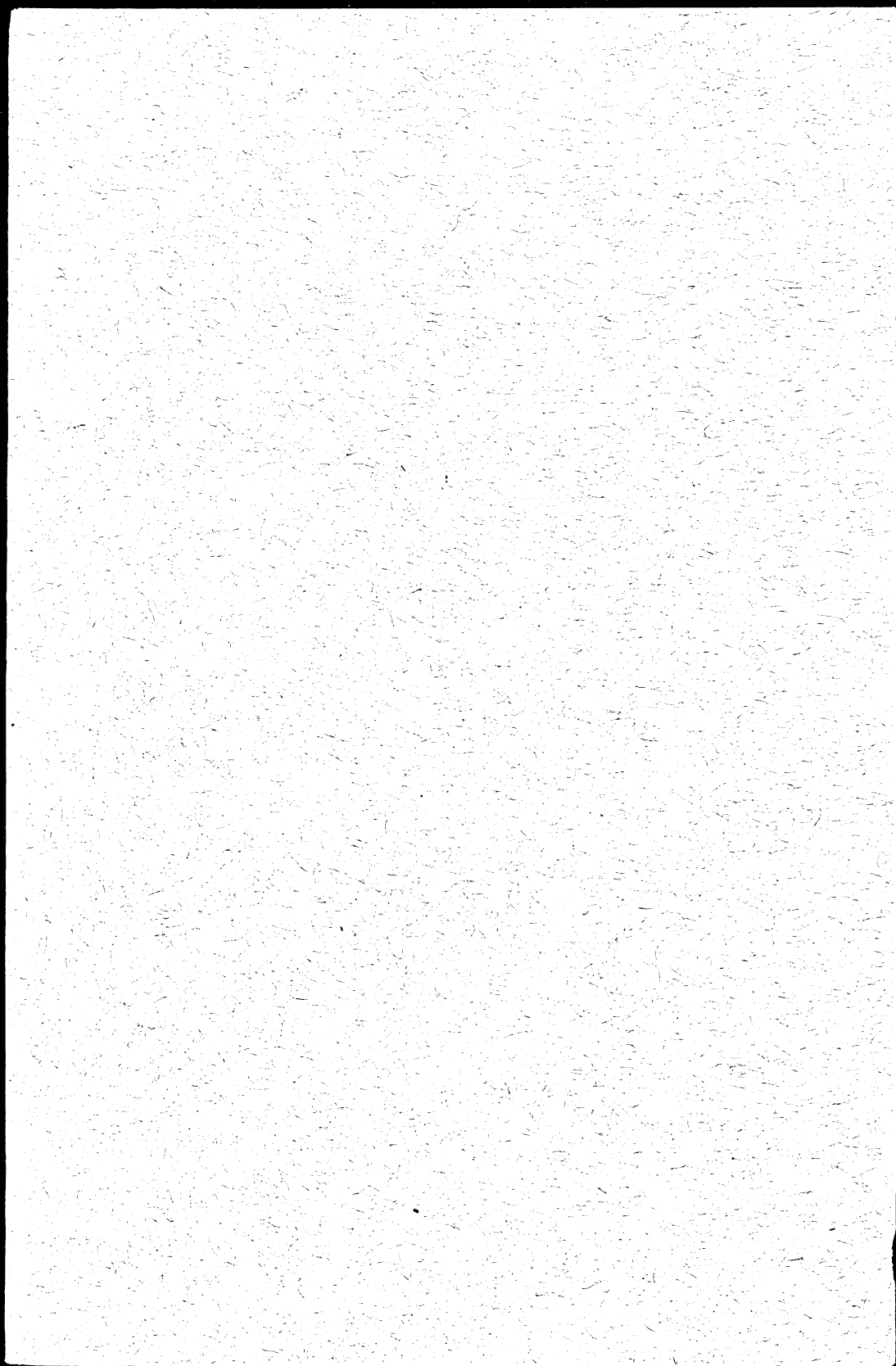
Grain harvest. Harvest of 150 acres of grain let to gang of six at 10s. per acre. This payment covers opening up, stooking, loading, and stacking. The payment varies according to conditions of crop and may be as low as 8s. an acre.

Beet harvest. 45s. to 47s. 6d. per acre for pulling, knocking, topping and loading into carts. (11 men for 60 acres.)

Potato harvest. 35s. to 40s. per acre for picking over first time and once harrowing and loading into carts. 2s. 6d. a ton and upwards for sorting.

Thatching. 1s. 9d. a square.

Hedging. 7d. a chain.



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