



THE AGRICULTURAL ECONOMICS RESEARCH INSTITUTE, OXFORD

University of Oxford

THE WORK OF THE
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THE WORK OF THE AGRICULTURAL ECONOMICS RESEARCH INSTITUTE

THIS Institute was established in 1913 as the result of an application by the University to the Ministry of Agriculture for a grant in aid of economic research in agriculture. Six hundred pounds was the amount of the grant, the University contributed a further £300 and the Master and Fellows of Balliol College, to show their interest in the work, voted £50, so that the total annual income available at the start was £950.

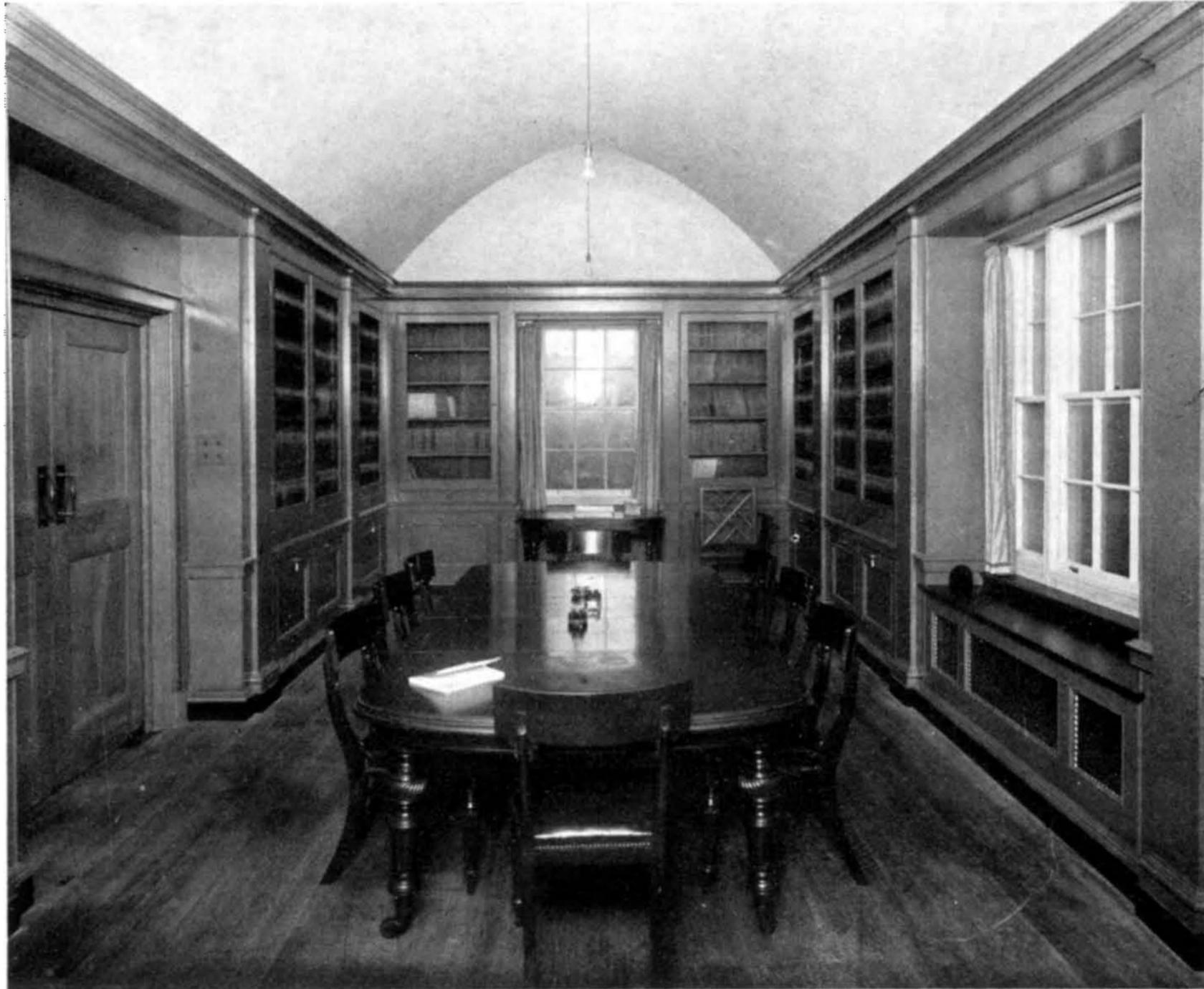
The responsibility for the Institute within the University devolved upon the Committee for Rural Economy, and this Committee delegated its functions to an Advisory Committee for Agricultural Economics, composed mainly of resident members of the University together with one or two other people who were thought likely to be helpful by reason of particular qualifications.

No scheme of work had been planned for the new Institute. The study of the structure of the agricultural industry and of the organisation of the farm is a comparatively recent development of modern agricultural research. In its earlier stages the investigation of the farmer's problems had been limited to matters arising out of the application of the physical and biological sciences to the production of crops and the breeding and feeding of live stock, and the setting up of the Institute in 1913 marks the realisation of the fact that the study of economics can also serve the rural community in many important ways. It has been said that 'farming is a business characterised by a high degree of economic uncertainty,' and that it suffers from successive periods of prosperity and adversity to a degree greater than other industries. One of the hardest facts that experience has taught about agriculture is that 'good' farming, *i.e.* the generous application of capital and labour to the business of production from the land, is not necessarily synonymous with successful farming. What the farmer needs, therefore, is the means

to reduce to a minimum the economic uncertainty inherent in his business, and this can only be provided by the systematic study of the industry in all its aspects.

Not only is such study necessary in the interests of the farmer and his man, but information is needed also for the better understanding of the larger question of the place of agriculture in national economy and of the problem of the directions in which development is possible. There are many who are ready to prescribe, for the ailments of the industry, their nostrums including such things as the reform of land tenure, the closer settlement of the land, industrial farming, the adoption of Danish methods and so forth. All these require interpretation in the light of prevailing conditions, and, whilst it is obviously outside the sphere of the investigator to apply himself to that which is often mere political propaganda, it is no less certain that it is his clear duty to study the facts of the situation and to elucidate them in a manner such as may assist the community to form right judgments upon questions of agricultural policy.

The brief account which follows must serve to indicate the way in which the Agricultural Economics Research Institute has interpreted the duties devolving upon it. In the first issue of this report upon its work (1925) some account was given of the investigations already made, or then in progress, directed towards the fulfilment of its objects. The present issue is a continuation of that account.



THE LIBRARY

I. FARM MANAGEMENT STUDIES

It may not be irrelevant to give a brief description of the methods employed by the Institute in conducting its studies in so far as they apply to farm management problems. In the great majority of cases this class of work involves the necessity of personal investigation amongst farmers and others engaged in the agricultural industry whose co-operation is vital to the conduct of such studies. Briefly the methods may be classified thus :

1. Cost accounting, { embracing the whole of the operations
2. Financial accounting, { of the farm.
3. Surveys,
 - (1) directed to investigations of the whole business of the farm, or
 - (2) dealing only with individual items of farm production or the cost of operating equipment, etc.

The cost accounting method entails the keeping of detailed records by the co-operating farmer of the daily employment of manual, horse, tractor, and other labour employed on the farm, of the quantities and kinds of seeds, feeding stuffs and fertilizers used for each department of the farm, and of the sales and purchases transacted.

These records are collected and analysed to their respective departments by the accounting staff at the Institute. Cost accounts of this description, besides being of great value to the individuals directly concerned are also to some extent a source of raw material for comparative study and for advisory purposes generally. They afford evidence of the costs and returns from all the enterprises of any one farm. They provide the cost of the various operations and the cost of operating different forms of power. They enable a check to be made on the consumption of food stuffs and other raw materials. Again, the labour data provide the material for the study of the distribution of labour throughout the year on crops and stock and of the competitive and comparative nature of the various enterprises, a knowledge of which is essential if modifications or radical teration in the system of farming are contemplated.

Although it is the most exact analytical method in use when studying the farm business, the costing method has its limitations. Only a relatively small number of accounts can be dealt with owing to the detailed nature of the work necessary, and this affords a very small sample of evidence on which to base general deductions, although this defect may be partly compensated by grouping the results of the same farms over a number of years. Alternative methods have therefore been adopted to secure a larger number of farms. This has taken the form, partly, of the collection of ordinary financial accounts from farmers who are in the habit of keeping records of their transactions. Besides a financial statement a description of the farm, the main lines of production carried out, the head of each class of stock carried, and the manual and horse labour, equipment, etc., are also secured. Grouped with similar information obtained from the costing accounts they supply on a wider scale valuable evidence of the capitalisation, of the turnover, of operating expenses, of the share of the net output taken by each factor in production, of the stocking capacity of the farms, and so forth. On these facts opinions of the efficiency of the methods of production carried out may be based. They give to individual farmers a means of comparing their own results with those of others engaged, not only in similar lines of production, but also in other types of farming. For the general study of farm economics this method, although it is not so detailed, has the advantage over cost accounting that with the same expenditure of time and energy deductions can be based on a larger number of cases.

Both these methods suffer from the limitation that they provide information of those businesses only of which the managers keep accounts, and for this reason they do not represent an unbiased sample of farming business. Thus, the resulting picture is related to what should be *prima facie* the more progressive farms, and although it has a distinct value from this point of view, there is a danger that lessons derived from such sources will tend to make the good farms better and to be of less advantage to the poorer farms.

The aim of the Institute is to help the whole farming community and it is arguable that more advantage would result from raising the efficiency of the many poorer farms a little than by improving the few better farms a great deal. To operate to its best advantage any farm must first be nicely attuned to the set of circumstances in

which it is placed, and, secondly, it must be balanced in itself. It should be possible to give a picture in figures and facts of the typical farm of any particular size and type in a district. Any farmer whose conditions are at all comparable could then work out similar figures for his own farm, and he could see wherein it differed from the average farming of his district, and the Agricultural Organiser or Advisory Economist armed with the same set of figures should be able to help him to modify his practice so as to keep it well above average.

The survey method is well adapted for presenting such a picture as has been described above. A general survey of the farm business is based largely on the farmer's estimates, and while it is undeniable that it may not approach the accounting method in the accuracy of individual material obtained, it covers a very much greater number of farms, and, which is even more important, the information secured may be taken as being really typical of the district surveyed. It is found that in districts properly surveyed there are not more than 10 per cent. of farmers who are unable to give information sufficient to justify the inclusion of their farms in the tabulations, and these 10 per cent. by no means consist entirely of any one type of farmer. The sample, in fact, represents an unselected 90 per cent. of the farming operations of the district, and this negatives, to a very large extent, the lack of accuracy of the individual returns. This apparent paradox can be explained by the fact that all farmers are not likely to estimate alike; some over-estimate, others do the opposite, and in the absence of prejudice, the average results probably give quite a small margin of error. Though the validity of the estimates have not been fully tested in this country, the unanimous nature of the results obtained by different research workers by this method, combined with the fact that survey figures often accord with well-known farming principles, rather suggest that it is a sound method in the approach to the study of the economics of farm management.

What farmers suffer from is a lack of knowledge of the methods used, of the progress made and of the financial results obtained by other farmers. They know their own business very well as a rule, but, although they may have ocular evidence of what is happening in their districts, they have little knowledge of the financial results. The survey materials do not gratify a farmer's desire by giving him pictures of individual farms, since all the evidence collected is considered confidential as far as individuals are concerned, but as the

result of grouping together the facts relating to a large number of farms he is able to secure an extensive picture of farming facts and practices in his district, against which he can place his own results. The survey data, properly analysed and presented, are analogous to the market intelligence report of prices. The latter enables the farmer to judge whether or not it is wise to sell, the survey data aim at providing the intelligence of efficient farm management and production with which a farmer may judge his own methods and on which he may decide a course of action. The survey data also set a district standard which can be placed against other district standards and used as a measure of the efficiency of one district against another. It is hoped by these means that the survey will operate towards raising the general level of farming.

The survey data will also strengthen unquestionably the material available for agricultural education purposes. Instead of drawing conclusions from a few chosen examples, or of making generalisations from a cursory examination of farming districts, it will be possible to give facts of the whole economic structure and organisation of the industry over a wide field.

✓ The method adopted in a general survey of the farm is to select types of farming which are fairly well defined as, for example, dairy farming, arable farming. An area is chosen and all the farmers within that district are interviewed by the survey party, which usually consists of one or two persons. The survey thus aims at establishing contact with every farmer in the particular district chosen, and in collecting evidence from him on every aspect of his business. When the survey is completed the information is examined at the Institute and tabulated in as many ways as may be found desirable in order to present the best picture of the farming for comparative study.

In addition to the general survey single enterprises are also studied by the same methods. In this way a study has been made of the cost of production of sugar beet and of the costs of producing Grade A (T.T.) Milk. An invitation is sent to farmers to co-operate in the study, and on their acceptance a questionnaire is forwarded and one or two personal visits are made to get complete information and to obtain farmers' opinions on the matter under review.

At the Institute no one method of study is given preference. All the methods outlined are used in the study of farm management

questions. The cost and financial accounting and survey methods are each valuable in different ways and all are essential to the Institute in carrying out its work.

1. COSTING

At the present time twenty-two farms, ranging in size from 150 to 2403 acres, covering a total area of 10,424 acres, are being fully costed. Much information of general value is being obtained from the cost data. For example, in operating expenses, it is found that horse labour cost varies from 3s. 4d. to 9s. 4d. per horse hour. The lower costs are usually found when a high number of hours are worked per annum, but this is not general, for quite low costs are sometimes found on grass farms where very little winter work is done and the horses are kept out of doors. This rather suggests that there is an *optimum* number of days of work and costs for different styles of farming.

Tractor costs during last year ranged from 2s. 10d. to 4s. 0d. per hour worked. One of the most serious aspects of the tractor on the farm is the small number of hours worked during the year, and depreciation charges are consequently unusually heavy.

An illustration of the value of costing to the individual farmer is seen in the following milk costs on three farms :

TABLE I
SHOWING COST OF MILK PRODUCTION PER GALLON ON
THREE FARMS IN 1925

	<i>Farm O 4a.</i>	<i>Farm N 3.</i>	<i>Farm O 1.</i>
No. of Cows	34	14	21
Yield per Cow in gallons ...	686	579	435
Cost per Cow	£30 3s. 3d.	£52 9s. 9d.	£27 6s. 9d.
Cost per gallon :	<i>d.</i>	<i>d.</i>	<i>d.</i>
Food	6-70	10-23	8-08
Labour	2-22	6-45	4-25
Other Expenses	0-71	3-24	1-54
	9-63	19-92	13-87
Carriage	0-92	1-83	1-20
Total	10-55	21-75	15-07

Farmer O 4a may be regarded as a better than average producer, obtaining good yields and running his herd very economically as regards labour.

Farmer N 3 however, though he has a fair yield, was very extravagant with foodstuffs and his labour was excessive. The latter was partly to be accounted for by the fact that his herd was not of an economical size, as it lay between a one man and a two men unit. More cows are now being maintained and strict attention is being paid to rationing. Farmer O 1 presents another aspect of efficiency. His costs per cow contrasted with Farmer O 4a were as under :

	<i>Cost per Cow.</i>	
	<i>Farm O 4a.</i>	<i>Farm O 1.</i>
Foods :	£ s. d.	£ s. d.
Home Grown	8 12 7	8 17 2
Purchased	10 9 4	5 15 5
	19 1 11	14 12 7
Labour	6 5 11	7 14 1
Other Charges	2 3 0	2 16 5
	27 10 10	25 3 1
Carriage	2 12 6	2 3 8
	30 3 4	27 6 9

Although costs per gallon on O 1 were nearly 50 per cent. higher than on O 4a, yet it is seen that on the former the cost per cow was less than on the latter. The defect on Farm O 1 was in the yield, which was only 435 gallons per cow, and it was highly probable that the farmer would have secured increased output by improved standards of feeding. His purchased foodstuffs bill was £5 15s. 5d. per cow against £10 9s. 4d. on farm O 4a.

In addition to full cost accounting a study by survey methods of the costs of growing sugar beet in the Advisory Province of Oxfordshire and Northamptonshire was undertaken. A report has been circulated to sixteen co-operating farmers.

2. FINANCIAL ACCOUNTS

The collection and examination of financial accounts from various farmers was first undertaken in 1925. Fourteen accounts were

obtained, and a report with the comparative figures was circulated to the farmers co-operating. A similar and extended study is being undertaken this year.

Printed reports on these matters are in course of preparation, and will be available during the year.

This accounting work, both costing and financial, is carried on mainly within the Advisory Province of Oxfordshire and Northamptonshire. By arrangement with the Advisory Economists of other Provinces, however, the data collected by them in their areas will be available to the staff of the Institute for purposes of study on a wider basis than that afforded by the limitations of the Provincial areas.

Mr. Bridges acts as Advisory Officer while Mr. Upfold, as Accountant, is in charge of the clerical staff on the books.

✓ 3. THE SURVEY

A. General Surveys

The following general surveys have been carried out by the Institute :

<i>District.</i>	<i>Type of Farming.</i>	<i>No. of Farms.</i>
1. The Upper Thames Valley in Berkshire and Oxfordshire	Mixed	90
2. Oxfordshire (North)	Arable Feeding and Dairying	172
3. Northamptonshire		
4. Oxfordshire (South)	Mixed	145
5. " "	Mixed	119
6. Wiltshire	Dairying	200
7. Northamptonshire	Dairying	70
8. Northamptonshire and Leicestershire	Feeding	(Approximate) 80
		(Approximate)
Total		876

It is not intended here to elaborate the information which has been collected from these surveys. The details will be made available as the various reports are published. A few illustrations, however, will serve to indicate some of the facts which emerge in the process of tabulation of the materials collected.

The first table presented shows the average number of work horses carried per 1000 acres on holdings of various sizes, and also

how these are distributed between heavy and light draught horses for each size group :

TABLE II

SHOWING NUMBER OF DRAUGHT HORSES CARRIED AND THE NET RESULTS OF PURCHASES AND SALES OF HORSES PER 1000 ACRES

<i>Size-group.</i>	<i>Number of horses carried per 1000 acres.</i>			<i>Net result of purchases and sales of horses per 1000 acres.</i>	
	<i>Heavy Draught.</i>	<i>Light Draught.</i>	<i>Total Draught.</i>	<i>Expenses.</i> £ s. d.	<i>Receipts.</i> £ s. d.
Up to 49 acres	28·8	18·0	46·8	67 3 0	—
50-99	39·1	7·3	46·4	44 9 0	—
100-149... ..	33·0	4·1	37·1	28 15 0	—
150-199... ..	29·3	2·0	31·3	17 0	—
200-299... ..	26·1	3·3	29·4	—	41 3 0
300-499... ..	20·5	1·5	22·0	—	11 1 0
500 acres and over	20·4	1·2	21·6	—	20 15 0

The figures, which relate to a South Oxfordshire district, act as a measure of the number of horses required to work holdings of various sizes in this district. They also illustrate the necessity for a higher proportion of light draught horses on the smaller holdings. The information recorded also reveals incidentally the seriousness of the small holder's horse problem since, for example, he has to carry double the number of horses per 1000 acres as compared with holdings over 300 acres. The figures of the balance of purchases and sales of horses demonstrate another feature of farm economics. In this district it is to be observed that on holdings up to 199 acres in extent, draught horses are purely an item of expense, owing to the fact that the small holder does not have the facilities for breeding horses to meet his requirements, while on the large holdings horse breeding may be regarded as one of the productive sides of the farm business, serving not only to meet the requirements of the farm for work, but providing a surplus for sale.

Another illustration of the use of the survey is provided by a question which has been exercising the attention of bacon factory managers, namely, the lack of uniformity of the carcasses which they receive from farmers. One of the contributory causes of this state of affairs is, undoubtedly, the great variety of breeds and crosses of

pigs which are kept by farmers in this country. The following figures, taken from survey information, show the breed of sows kept and the boars used in a district embracing an area of approximately only 80 square miles :

TABLE III
SHOWING THE NUMBER OF HERDS OF EACH BREED OF SOWS
KEPT AND THE BOARS WITH WHICH THEY ARE MATED, IN
AN AREA OF 80 SQUARE MILES

<i>Sows.</i>	<i>Boars.</i>						<i>Total.</i>
	<i>Middle White.</i>	<i>Berkshire.</i>	<i>Large Black.</i>	<i>G.O.S.</i>	<i>Tamworth.</i>	<i>Large White.</i>	
Large Black ...	17	4	9	3	—	1	34
Berkshire ...	6	9	3	—	1	—	19
Middle White ...	4	1	3	—	—	1	9
Tamworth ...	3	2	—	—	1	—	6
Large White ...	2	—	1	—	—	—	3
G.O.S. ...	4	2	—	—	—	—	6
Wessex ...	—	2	1	—	—	—	3
Essex ...	—	1	—	—	—	—	1
Crossbreds ...	11	11	2	2	—	—	26
Unknown Breeds	3	3	2	—	—	—	8
Total	50	35	21	5	2	2	115

Of the pure breeds of pigs the table shows that Large Blacks and Berkshires are the most popular, followed by Middle Whites, and that sires of these breeds are also favoured for crossing purposes. It is to be noticed, however, that there are altogether thirty-four cross-bred and mongrel (unknown breeds) herds, equalling in number those of the most popular breed—the Large Black—and forming nearly 30 per cent. of the total number of herds under examination.

It will be observed also that, leaving out cross-breds and unknown breeds, there are eight pure breeds of sows and six breeds of boars used in this district. While it is true that the production of pork is practised in the district as well as that of bacon pigs, the wide variations in breeds and the crosses of breeds which are exhibited by these figures, suggest the cause of the poor bacon carcasses so often obtained and the scope for improvement which exists.

Again, in regard to implements and machinery the survey enables many valuable lessons to be drawn. An illustration is given in the

following table giving the number of self binders in use related to the acres of corn grown :

TABLE IV
SELF BINDER REQUIREMENT FOR VARIOUS ACREAGES
UNDER CORN

<i>Number of acres of corn per Farm.</i>	<i>Percentage of Farms having :</i>					
	<i>No Binder.</i>	<i>One Binder.</i>	<i>Two Binders.</i>	<i>Three Binders.</i>	<i>Four Binders.</i>	<i>Five Binders.</i>
	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
Up to 20	56	44	—	—	—	—
21 to 40	18	82	—	—	—	—
41 to 60	—	88	12	—	—	—
61 to 80	—	69	23	—	8	—
81 to 100	—	45	46	9	—	—
101 to 150	—	17	83	—	—	—
151 to 200	—	13	50	37	—	—
200 to 570	—	—	—	14	43	43

A frequency distribution of 20 acres has been taken up to 100 acres. After this two groups of 50 acres are given and then a last one ranging from 200 to 570 acres of corn. This differentiation was necessary owing to the smaller number of farms with acreages of corn over 100 acres, a limitation which is always found in any survey covering a given district. The table demonstrates quite clearly the binder requirements for given acreages. Up to 80 acres of corn can evidently be handled quite successfully by one binder, though it is doubtful whether it is wise to *own* one in the group up to 20 acres. Here the cases are equally divided between no binder and one, but the majority of those with none either hire or borrow. The group of 81-100 acres marks the dividing line between one or two binders. Here 45 per cent. succeed with one, while 46 per cent. think it necessary to have a second in reserve. The 101-150 acres group definitely requires two binders, and it seems that the dividing line between two and three binders lies within the 151-200 acres group. In groups which show a predominating percentage of farmers exercising a preference for a given number of binders it is probable that those varying from the majority have either too few or too many binders. For example, the 8 per cent. of farms with 61 to 80 acres of corn having four binders, and the 9 per cent. of farms in the 81 to 100 acres group with three binders have too many binders,

whereas in the 101 to 150 acres group the 17 per cent. shown as having one binder would probably be better with two machines.

Continuing on the machinery question, Table V is of general interest.

TABLE V
HARVESTING AND HAYMAKING MACHINES PER 1000 ACRES

<i>Machine.</i>	<i>Size Group Acres.</i>						
	0-49	50-99	100-149	150-199	200-299	300-499	500 and over
	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>
Corn Drill	5.5	7.3	5.1	4.7	4.4	3.7	2.3
Self Binder	8.1	6.0	6.8	5.7	5.4	5.2	4.4
Mowing Machine ...	13.6	12.7	8.4	8.5	7.7	6.5	3.9
Hay Loader or Sweep ...	—	0.7	4.5	2.8	2.8	3.3	1.2
Elevator	—	0.7	1.7	1.9	3.0	2.4	1.4

This table conveys the general superiority of the large farms in the economy of the use of machines mentioned, and it also indicates the serious disadvantage in which small holders must find themselves by the lack of such machines as hay loaders and elevators. The former does not become common until the 100-149 acre size of holding is reached, and the use of the latter only appears to become general on farms of 200 acres and over.

The existence of variations in the cost of equipment, in the number of work horses required, and in the manual labour necessary for holdings of different sizes when compared on an acreage basis has been recognised for some time. Studies which have been completed by the Institute from individual district surveys indicate that there are many similar tendencies in regard to other economic factors. In the first issue of the Work of the Institute published in 1925, many examples were given from the surveys carried out by the Institute showing that production and the nature of the business were also influenced by the size of holding, and also that, though similar tendencies held for different types of farming, the variations were not so pronounced in some cases.

It has become a matter of extreme importance for advisory and other purposes to ascertain what differences exist in relation to size of holdings and the range of variation within size groups, and as previous work in this direction has only dealt with the limited number of farms embraced in a single survey, the Institute now

proposes to regroup and reclassify all the farms surveyed. By this means a large number of farms will be reviewed for each size group, and for given types of farming, thus ensuring a fair measure of certainty to the conclusions which may emerge from the study.

The general survey work is in the hands of Mr. Bridges and Mr. Dixey. Mr. Thomas and two scholars—Mr. Currie and Mr. Davies—are assisting.

B. *Special Surveys*

(a) *Small Holdings in Carmarthenshire.*—A study of the social and economic significance of the small unit of cultivation in a typical peasant district of Wales has been completed. A comprehensive enquiry into the total numbers of farms of varying sizes within the district, based on the entries of properties in the parish rate books, has revealed considerable discrepancy with the official statistics on this subject, while an investigation of the nature of the tenure of the holdings also showed great variation from the latest official statistics on this point. Another subject of considerable importance, but regarding which there is no official statistical information, is the nature of the employment of the occupiers of the smaller holdings in the country, and the following table is therefore of particular interest since it affords evidence on this point on 4087 holdings under 50 acres in extent found within the area of the survey.

TABLE VI
SHOWING THE EMPLOYMENT OF 4087 SMALL HOLDERS

<i>Size group.</i>	<i>No. of Holdings.</i>	<i>No. with Farming as only Employment.</i>	<i>No. with additional Employment.</i>	<i>% No. with Farming as only Employment.</i>	<i>% No. with additional Employment.</i>
1-10	1322	448	874	33·9	66·1
10-20	962	414	548	43·0	57·0
20-30	646	375	271	58·0	42·0
30-50	1157	945	212	81·7	18·3
1-50 acres	4087	2182	1905	54·1	45·9

It will be seen how the proportion of occupiers wholly dependent on their holdings for their livelihood rapidly decreases as the holdings become smaller in size. A census of the employments of the 1905 small holders engaged also in non-agricultural trades illustrates the

TABLE VII

[SHOWING SUMMARY OF SURVEY OF 262 SMALL HOLDINGS IN WALES

	No. of Holdings.	Rent per Acre.	No. of Persons employed in 'Men' Equivalents per 100 Acres.	% Arable Land.	Stock carried expressed in 'Animal' Units per 100 Acres.					
					Cattle.	Horses.	Sheep.	Pigs.	Poultry.	Total.
A. Highland Holdings.		£ s. d.								
(1) Under 30 acres ...	19	1 2 1	6·3	11·3	38·1	4·3	3·2	2·3	2·3	50·2
(2) 30 to 60 acres ...	64	17 0	5·6	15·0	25·1	5·3	4·8	1·4	1·4	38·0
(3) Over 60 acres ...	17	9 9	3·2	12·9	15·4	3·3	9·8	0·7	0·7	29·9
<i>All Highland Holdings ...</i>	100	14 9	4·9	13·8	22·4	4·5	6·2	1·2	1·2	35·5
B. Lowland Holdings.										
(1) Under 25 acres ...	27	1 17 3	10·8	2·2	39·9	5·8	0·0	2·3	4·1	52·1
(2) 25 to 50 acres ...	105	1 11 0	6·3	6·7	38·9	5·9	2·0	2·2	1·6	50·6
(3) Over 50 acres ...	30	1 9 2	5·4	8·1	33·4	5·6	2·7	1·1	1·3	44·1
<i>All Lowland Holdings ...</i>	162	1 10 5	6·4	6·7	37·2	5·7	2·0	1·9	1·7	48·5

present importance of the small holding to the country labourer, the village artisan, and the village tradesman, while it shows also how extensively it is patronised by the industrial labourer.

The main study concerned itself with an extensive survey of 262 small 'family holdings,' i.e. holdings on which the occupiers are fully employed and from which they expect to earn their whole income. The chief results are summarised in Table VII.

The table shows that arable cultivation is practically negligible for all the holdings, it also shows the superiority of the smaller holdings in point of numbers of stock carried. The importance of cattle, pigs and poultry on the small farm is also brought out, as well as the serious significance of their horse problem. Lastly, the third column of the table illustrates the fact that the smaller holdings provide much more employment to the acre than do the larger farms.

Considerable light is thrown on the financial position of these small holdings by an analysis of simple cash accounts kept on a sample of ninety-three of the holdings included in the survey, the relevant details of which are given in Table VIII.

The influence of the size of the holdings both on the receipts per acre and on the expenses per acre will be observed, each of these items manifesting an inverse movement to the size of the holding. Similarly the relations of these two factors to the altitude is also shown, both the receipts per acre and the expenses per acre being considerably higher for the lowlands than for the highlands. The final economic test of the business of these holdings is shown by the net balance per acre which is arrived at after allowing for the remuneration of family labour at current rates of wages and for interest on the capital employed, and the result is shown in the last column of the table. The serious effect of the high family labour and the comparatively high rate of capital employed on these small holdings is shown in an adverse net balance in all groups of farms except those devoted chiefly to milk selling. Judged by the mere economic test the position of the wage-labourer is better than that of the majority of the small holders. The survey was the work of Mr. E. Thomas. The results, which will be published in due course, have been embodied in a thesis which has been approved for the degree of B.Litt.

(b) *Market Gardening in the Vale of Evesham.*—A special study has been made of the origin, growth, and present development of the

TABLE VIII
SHOWING SUMMARY OF FINANCIAL RESULTS OF 93 SMALL HOLDINGS IN WALES

	<i>No. of Holdings.</i>	<i>Money Receipts per Acre.</i>	<i>Money Expenses per Acre.</i>	<i>Balance of Money Receipts over Money Expenses per Acre.</i>	<i>Net Balance per Acre, after allowing for Payment of Family Labour and Interest on Capital.</i>
		<i>£ s. d.</i>	<i>£ s. d.</i>	<i>£ s. d.</i>	<i>£ s. d.</i>
A. Highland Holdings.					
(1) Under 40 acres	11	5 7 7	2 13 1	2 14 6	-0 11 9
(2) 40 to 60 acres	10	5 4 1	2 14 10	2 9 3	-0 7 9
(3) Over 60 acres	8	3 8 1	1 11 6	1 16 7	-0 0 11
Average	29	4 8 8	2 4 0	2 4 8	-0 6 11
A. Mixed Lowland Holdings.					
(1) Under 25 acres	13	7 14 9	4 17 3	2 17 6	-1 11 8
(2) 25 to 40 acres	24	7 12 5	4 13 9	2 18 8	-0 13 1
(3) Over 40 acres	14	7 3 8	4 11 9	2 11 11	-0 7 8
Average	51	7 9 7	4 13 2	2 16 5	-0 14 2
C. Milk-Selling Lowland Holdings ...	13	11 1 3	6 19 5	4 1 10	0 12 1

fruit growing and market gardening industry in the Vale of Evesham. In order to obtain accurate information a detailed study of the holdings in one typical parish was undertaken. Data were collected as to the different crops grown and rotations practised, yields of crops, kinds and quantities of manures used, methods of marketing produce, number of men employed, rent, rates, etc., conditions of tenure with special reference to the Evesham Custom, and any other facts likely to throw light upon the economic development of this industry. The survey is not yet complete, but there is already sufficient evidence to prove that where conditions are favoured for the cultivation of the soil in this intensive manner the returns per acre as measured in quantity or value, are much higher than those obtained by any other farming system, while the number of men employed is very much greater. What is perhaps of more importance in an economic sense is that this system when intelligently adopted, appears to be at least equally as profitable as the more extensive farming systems. Fuller information on this important point will be available when the survey has been completed. Mr. Meredith is engaged upon the work, assisted by Mr. Johnson.

(c) *Grade A (Tuberculin Tested) Milk.*—At the suggestion of Dr. Stenhouse Williams and with invaluable assistance given by him and by Mr. J. S. Simpson, advisory economist in the Reading University advisory province, the Institute has carried out an investigation of the economics of Grade A (T.T.) milk. The standards set by the Ministry of Health for different grades of milk have necessitated further capital outlay by, and additional annual charges to, producers undertaking to supply the better qualities of milk, and while it is in every way desirable that the nation should have a clean and disease-free milk supply it is only reasonable that such a price should be paid for it as will ensure a fair profit for its producers. In the case of Grade A (T.T.) Milk a conventional figure of 3d. per gallon has been paid over and above the price paid for milk produced under ordinary conditions, and the purpose of the investigation, which was carried out by Mr. Liversage, was to discover whether or not this extra price covered the additional costs involved. The enquiry took the form of a survey of Grade A milk producers, whose estimates of the costs of new equipment and of converting existing buildings, of the loss incurred through the disposal of reactors, and of the annual outlay involved for labour and so on were obtained. In some

cases actual cost accounts were received from the Reading University Agricultural Economics Department. Altogether 23 sets of figures were secured.

Mr. Liversage finds that, with certain qualifications, and after reducing all figures of capital outlay to their annual equivalent, the total extra cost of producing Grade A (T.T.) milk on these farms is on the average 2·86d. per gallon leaving a margin of ·14d. per gallon or 6s. 4d. per cow for profit, which appears to be a very inadequate inducement to take up the additional burdens of supplying clean milk. The loss on reactors, which, for the first year, has been treated as a capital loss and spread over a period of 10 years, and in the subsequent years as an annual charge, only accounts for 8 per cent. of the additional costs, which is surprising in view of statements usually made on the subject. The conversion of buildings and provision of an adequate water supply again only form quite a small proportion (16 per cent.) of the cost. It seems desirable, in view of the comparatively small number of cases under review, to obtain confirmation of these figures, and they suggest the need for obtaining adequate data on a much wider scale. The main item is the labour involved in the additional cleaning of cowsheds, etc., and in grooming and milking, these items accounting for no less than 50 per cent. of the extra costs. Mr. Liversage's results have given precision to the main factors involved.

Two points have arisen in the work which seem to be important in connection with the development of a clean milk supply. The first concerns the conversion of buildings. A tenant farmer must secure the consent of his landlord to carry out the improvements, otherwise he is debarred from receiving compensation for his outlay when he leaves the farm. This may have a retarding effect on the extension of the movement for clean milk supplies. The second point is probably more serious. It seems to be not only a possible but also a frequent practice to dispose of cows which have reacted to the tuberculin test, as potential dairy animals. While this does not directly add to the number of tuberculous cows in the country, it may have the effect of spreading infection, and of increasing the number of young stock infected with this disease; at any rate it does nothing towards stamping out tuberculosis.

Mr. Liversage's report is being published by the Institute.

(d) *Sugar Beet*.—The Subsidy voted by Parliament in 1924 on sugar manufactured in Great Britain from home-grown beet, gave the necessary impetus to the growing of sugar beet in this country, and to the establishment of a home-grown sugar industry on an extensive scale. The introduction of an entirely new crop raised cultural and economic questions of fundamental importance to the agricultural community and the inception of an industry, to all intents untried in this country and aided by public funds, introduced contractual relationships of a novel character between farmers and sugar manufacturers. In view of these facts and of the insistent demands made by farmers to be informed of the prospects of sugar beet, it became necessary to make a careful and unbiased survey of the economics of the crop in its broadest aspects. In order to answer the questions of more immediate importance a cost of production study was inaugurated by the Institute in the autumn of 1924 to cover the operation of the 1924-5 crop, which was the first to receive the benefits of the subsidy. Information was collected by *questionnaire* and survey methods from farmers in the Eastern and East Midland counties, and the results of the study are embraced in the Research Monograph No. 3 published by the Ministry of Agriculture and Fisheries at the end of 1925.¹

While costs of production were the main subjects of the study several other matters arose as the inquiry proceeded. These involved a consideration of the value and utilisation of by-products, of the supply of and demand for labour, of the capitalisation necessary and of the effect of the introduction of the crop on farm routine and on farming systems, and these questions are dealt with at some length in the monograph. The main facts which emerged from the study were :

(1) That in the thirty-four individual cases studied wide variations in the cost of production were found. In the cases of a field crop in the experimental stages this was only to be expected.

(2) That on the whole the crop was profitable, giving an average profit of £1 15s. 2d. per acre, though twelve out of thirty-four costs disclosed losses. This profit gives some indication of the competitive power of sugar beet with other similar crops, and it seemed that the price ruling for the 1924 crop of 44s. per ton, *plus* a bonus on sugar

¹ *Sugar Beet, Costs of Production, Yields and Returns in 1924*, A. Bridges and R. N. Dixey, 3s.

content, was hardly a sufficient inducement for farmers to embark freely on the new enterprise.

(3) That owing to the undeveloped state of the manufacturing side of the industry transport costs were very heavy, and this indicated the need for concentration of factories.

(4) That in the farmer's mind the main factor limiting the expansion was that of labour, the supply of which was extremely variable, although the necessity for additional supplies differed considerably with individual circumstances.

(5) That it was too early to indicate the probable effect of the introduction of the crop on farming systems either as regards the stock economy or the retention of land under the plough.

As an example of the wide variations in costs of production the following frequency distribution of the figures may be advanced :

TABLE IX
SHOWING FREQUENCY DISTRIBUTION OF COSTS OF
PRODUCTION OF SUGAR BEET IN 1924-5

Costs per ton of unwashed roots ...	15s. to 25s.	26s. to 35s.	36s. to 45s.	46s. to 55s.	56s. to 65s.	66s. to 75s.
No. of Costs ...	1	15	8	6	1	2
Costs per ton of unwashed roots ...	76s. to 85s.	86s. to 95s.	96s. to 105s.	106s. to 115s.	116s. to 125s.	126s. to 135s.
No. of costs ...	—	—	—	—	—	1

Most of the high costs were due partly to low yields—which in some cases could be attributed to the effect of season, cultural defects and so forth—and also to excessive labour costs at certain stages of the operations on the crop, but they reflect, in no small measure, the risks inherent in a new undertaking which must be fairly and adequately explained in examining the present position of the crop in so far as its affects the welfare of the farming community.

While it was evident that the growing of the crop was largely experimental and therefore costly, the results, where good yields

were obtained, suggested that there was plenty of scope for reduction on the costs of production, as the following figures illustrate :

TABLE X
SHOWING INFLUENCE OF YIELD OF SUGAR BEETS ON
COSTS OF PRODUCTION

	<i>Low Yield.</i>	<i>Farm Cost Per Ton.</i>	<i>High Yield.</i>	<i>Farm Cost Per Ton.</i>
	<i>Tons.</i>	<i>s. d.</i>	<i>Tons.</i>	<i>s. d.</i>
Light Soils	3·71	74 3	14·77	20 8
Medium and Heavy Soils ...	5·94	68 5	14·93	26 0½
Fen Soils	7·36	37 11	15·25	30 5

It seemed desirable also to trace the influence which the sugar beet crop might have in agricultural economy generally, to place it in proper perspective among the crops grown in this country, and to enable an estimate to be made of the cost to the exchequer on account of the subsidy. For this purpose an examination of the agricultural statistics of Continental and other countries was accomplished, and, using their acreage figures as a basis, a forecast of the

TABLE XI
GIVING ESTIMATES OF SUGAR BEET DEVELOPMENT IN
ENGLAND AND WALES

	<i>Acres of Sugar Beet.</i>	<i>Per Cent. of Arable Land Area.</i>	<i>Approximate Annual Subsidy on Present Scale.¹</i>	<i>Approximate Annual Subsidy on 1931-3 Basis.</i>
Acreage calculated on basis of that of Germany and whole of France ...	170,880	1·6	3,759,000	1,253,000
Acreage calculated on basis of that of Holland and Belgium (pre-war) for part ² of England and 0·5 per cent. for remainder	244,626	2·2	5,382,000	1,794,000

¹ In addition to the annual subsidy there will probably be a loss to the revenue through the remission of excise duties. In the present fiscal year on an acreage of 130,000 acres of beet the loss has been estimated to be £500,000.

² Counties with 60 per cent. or more of arable land in 1925.

probable development in England and Wales has been made. A full discussion of the figures is given in an article contributed by the investigators to the current issue of the *Journal of the Royal Agricultural Society* (Vol. 86, 1925), entitled "A Study of the Sugar Beet position." Briefly, the results show that the probable expansion is not so large as was first imagined and that the crop is not likely to encroach to any appreciable extent on the arable area. The extent of the development which is considered to be most likely is shown in Table XI., together with the amount of subsidy involved.

Further studies are in progress. One on the costs of production for the 1925 crop is being concluded. The question of the utilisation of labour is being further examined and the relative profitableness of this crop and other field crops is being investigated. Finally, the future position of the crop and the ability of the home-grown sugar industry to compete in the world sugar market are economic problems which must be faced. It is hoped that a survey which is being undertaken of the conditions under which the crop is grown in the chief Continental sugar beet growing countries may throw some light on these questions.

Mr. Bridges and Mr. Dixey are in charge of these investigations.

4. THE MAINTENANCE OF ARABLE FARMING

A recent research undertaken by the Institute is directed towards the consideration of how to maintain the proportion of plough-land. Statistics show that the war-time accretions have been lost and at the present rate of reversion another year or two will suffice to bring the arable total far below its previous low record. Everybody knows that plough-land employs more labour and yields a greater product than grass-land (except in some of the more favoured dairying districts) but it has still to be demonstrated that certain types of land can yield a profit under the plough in the prevailing economic conditions, and that farmers are not justified in playing for safety by laying land down to grass. If there be no alternative to the traditional practice on arable land it is fairly safe to say that falling prices can only be countered by reducing production and employment, and grass-land farming represents the ultimate end of steps in this direction. But recent experimental work in the direction of live stock maintenance on arable crops instead of on grass, combined with the experience of farmers, here and there, who have had the

courage to experiment for themselves, gives reason to hope that a departure from the traditional practice in the direction of using plough-land more for the growth of forage crops for stock, and less for corn crops, will show financial results which will justify the extension of the present arable area. In this connection the Scottish practice of long leys in substitution for permanent grass is interesting, since such successful ventures as have been noted in England, which have for their object the maintenance of the plough-land of the farm, are associated with it.¹

With the object of testing the economics of arable stock farming, a rapid survey of the country was made in the autumn of 1924, to locate farmers who were venturing in this direction, and ultimately arrangements were entered into with seven of them, by which the Institute was to be allowed to study the methods and practices employed, and for this purpose to be allowed to keep full records of the results. In two cases the farmers themselves are collecting accurate data sufficient for the purpose of an adequate study of the system of management; in the remainder, recorders have been placed upon the farms whose duty it is to keep account of everything necessary to this end. Valuable results are looked for, but it is obvious that nothing conclusive can be expected until records extending over four or five years are available.

Besides this work, the Institute is concerned more directly in testing the specific problem of dairy-farming on arable land, as a departure in intensive farming suitable for the small holder. Three small farms, situated in Middlesex, in Nottinghamshire and in Cornwall respectively, were taken over from the Ministry of Agriculture at Lady Day 1925, and are being administered by the Institute. In some respects these experiments may be less valuable than the former ones in that the small holdings are worked by paid foremen instead of by tenants adventuring their own capital, but arrangements are made as to payment of labour which do much to obviate the difficulty of securing normal conditions for experiment. In these cases, again, definite results cannot be expected for a few years, but evidence on certain points of interest may already be noted. For example, it is pretty certain that intensive dairying by small

¹ See J. P. Maxton and C. S. Orwin, 'The Maintenance of Arable Cultivation in Scotland.' *Journal of the Ministry of Agriculture*. Vol. XXXI., No. 8. (November, 1924.)

holders is only possible in the proximity to very good markets, where milk, vegetables, etc., can be sold at practically retail prices. In Middlesex and in Nottinghamshire milk is fetched from the small holdings by local retailers at very good prices, which saves the time of the small holder in delivering to the station and also the cost of pony and cart. These are very considerable items. Similarly, proximity to an industrial market enables the arable small holder to take other chances by putting in, for example, an acre or so of potatoes, or a few rods of cabbage, carrots, etc. In contrast to these conditions the third small holding, in Cornwall, has no local market for anything, and the occupier has to send his milk away by rail to compete in the open market with the whole of the West of England. In times of glut, like the present, these small unorganised producers are the first to feel the difficulty of disposal of produce, and for some few months now not a drop of milk has been sold from this holding, with very disconcerting results.

Another problem which can very soon be settled is that of the proportion of grass which every small arable dairy farm must necessarily have. The first thing found on taking over the three farms was that none of them had sufficient grass-land, neither permanent nor temporary, to make it possible to rear heifer calves and carry young heifers and dry cows in the cheapest possible way. They represented, in fact, arable dairying carried to the point of absurdity, and it is now pretty well established what the balance of arable and grass-land must be.

Upon a few points such as these useful information is coming to hand quickly but upon the larger question of whether arable stock farming can definitely be advocated as the means for increased employment and production more time and experience is needed.

This work is in the hands of Colonel W. R. Peel, assisted by a few post-graduate students acting as recorders.

5. THE OPERATION OF THE LAW OF DIMINISHING RETURNS IN AGRICULTURE

The economic crisis which agriculture has experienced since the war ; the general realisation that measures need be taken to raise the level of production without lowering the standard of living ; and the desirability on many grounds of restoring the balance, so far

as this may be possible, between agriculture and industry in an over-industrialised country—these are among the chief reasons which make it desirable to determine whether, under what conditions, and to what extent the policy of ‘high farming’ can be safely recommended.

Inseparably linked with these questions is an economic generalisation known as the ‘Law of Diminishing Returns,’ and the chief object of the research now under consideration, is to show in what precise way the ‘law’ operates as regards agriculture, what quantitative interpretation can be given to same, and, this done, what conclusions may then be drawn.

It was considered desirable to make the scope of the investigation world-wide and to frame a study based on data obtained from the principal agricultural experimental stations throughout the world. The scheme of work has been as follows :

After examining the historical and economic aspect of the law, its applicability to agriculture is next considered, and the mathematical representations of the law are discussed.

The experimental data are treated statistically and are classified according to the following scheme :

- (1) Manurial experiments on crops :
 - (a) Temperate zone crops.
 - (b) Sub-tropical and tropical zone crops.
- (2) Cultural experiments :
 - (a) Depth of ploughing and subsoiling.
 - (b) Cultivations.
 - (c) Irrigation.
 - (d) Rate of seeding.
 - (e) Spraying.
- (3) Meat Production.
- (4) Milk Production.

The preceding evidence is then analysed and its relation to current prices of produce and expenditure incurred (*e.g.* cost of fertilisers) determined.

In the last part of the study the subject of population and food-supply is discussed.

This research is being carried out by a voluntary worker, Mr. G. Frecheville.



A TYPICAL STREET MARKET
(From *The Marketing of Farm Produce*, Part I., Livestock)

6. THE MARKETING OF FARM PRODUCTS

Research in marketing was first undertaken in the beginning of 1925, with the appointment of Mr. F. J. Prewett and, subsequently, of Mr. D. Skilbeck as student assistant. It was felt that from the farmer's point of view it was clearly no less important to understand how to dispose satisfactorily of commodities than how to produce them in the first place.

On the subject of marketing most farmers, investigators, and other persons interested were found to entertain certain general ideas to the effect that there are too many middlemen, that the spread between producer and consumer is too great, and that farm produce lacks the consistency and standardisation which is essential to economic distribution, and they were found to agree on certain general remedies for these problems, chiefly by popularising the theory of co-operation. But there appeared to be a serious absence of precise information concerning the actual processes of agricultural marketing, without which it would obviously be unwise to endeavour to provide remedies. In fact, what attention had been devoted to marketing had been on the lines of suggesting palliatives for certain difficulties which were generally assumed to exist, without inquiring whether the remedies were suitable for the disease, whether the disease in fact existed, or even whether the real trouble was the apparent one and did not lie deeper in conditions less obvious.

As a preliminary, therefore, marketing research has taken the form of an extended investigation into the actual methods and conditions of the sale of farm produce, so far as possible from the position of the farmer's interests. Only when the reasons underlying the methods by which farmers market their produce, whether they are founded on custom, preference, or compulsion, have been fully examined, can it be expected to distinguish those features of the present system which are satisfactory from those which are open to economic improvement. A further consideration is the fact that any effectual reform must originate from the farming community by the farmers' own efforts, and the object of marketing research must be to provide an accurate and detailed statement of existing conditions, as a basis for constructive effort on the part of farmers.

The results of the inquiries and investigations are being issued in a series entitled *The Marketing of Farm Produce*. The first

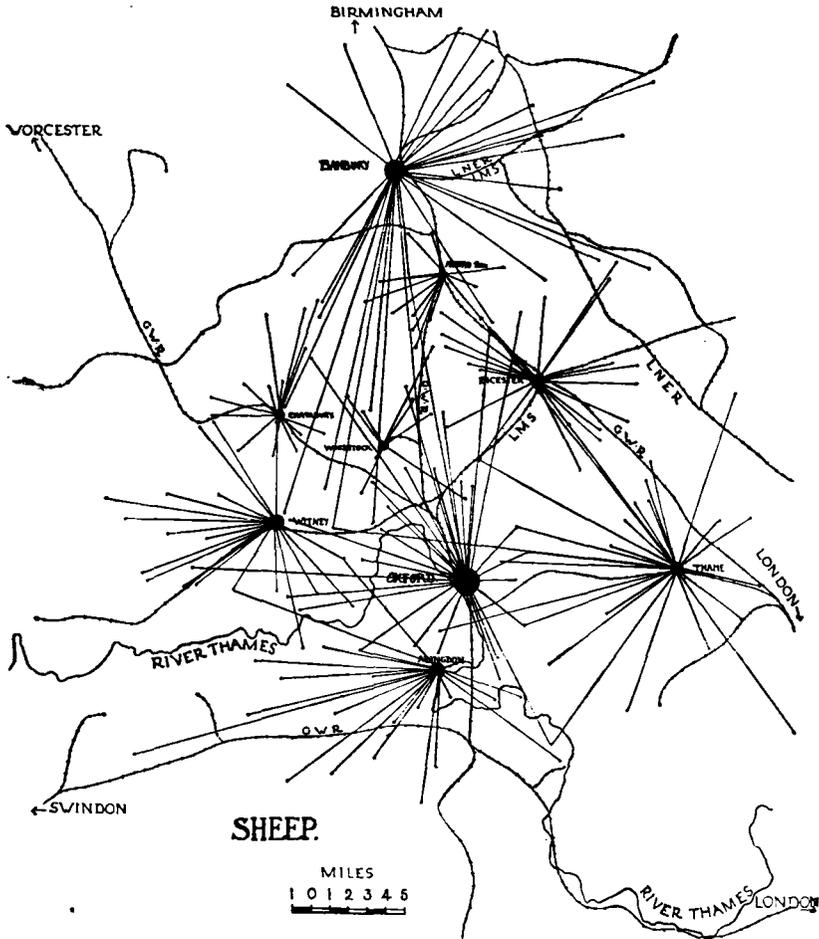
section consists of a study of live stock marketing, and subsequent sections will deal with milk and milk products, wool, corn, etc.

Live stock marketing is found to be governed by certain characteristics necessarily associated with live stock production. First, the standardisation of cattle, sheep and pigs is impossible and renders sale by sample or description difficult. The fact that the prospective buyer must see the whole of the live stock in question and as many more lots as possible, for purposes of comparison, greatly increases the number of agents, the cost of transport, and the permanent equipment required for their sale. Secondly, the marketing of live stock is bound up with established market-places, over which local authorities consisting of tradesmen, never of farmers, have full control by ancient charter. The result is that these markets, designed for an age when each local district was self-supporting, are utterly unsuited to modern conditions, when the whole country is knit together by railways, when there is a great concentration of industrial workers, and when half of the nation's meat is imported. Thirdly, very many of the existing anomalies are due to the financial dependence of the farmer upon the middleman, and the remedy must be sought further back in devising a solution of the whole difficult problem of agricultural credit. These are perhaps chief among a considerable number of governing conditions that are found to emerge in a study of live stock marketing.

An important aspect of the work in live stock marketing has been the making of a survey of the sources and quantities of the supplies sold through a particular group of markets in the Oxford district. The results of this survey afford valuable evidence not only of the over-lapping of the fields of various markets, but of the redundant and obstructive character of several of them, in respect particularly of pigs and cattle, in which, owing to the limited quantities on sale, the few buyers who visit these small markets tend to organise 'rings' with the objects of depressing prices to the producer. This survey further indicates that the common contention of farmers to the effect that numerous markets are essential, owing to the difficulty of consigning live stock a considerable distance, is not borne out by facts. A very definite discrimination is indicated by the farmer as to the market to which he will consign certain stock, to the extent that Abingdon draws pigs from a considerable radius and cuts across the expected field of the other markets, whereas

certain other small markets, such as Woodstock, secure no pigs whatever.

Perhaps the chief source of weakness in live stock marketing lies in the lack of a service of advance information as to supplies and



prices over a large area, by means of which individual consignors might have some guide as to the probable demand for their produce on any given day. The farmers themselves are at fault in that they have not made, and appear disinclined to make, any effort to co-operate in the matter of controlling jointly the incidence of supplies. As a result, severe price fluctuations occur from market

to market. Cattle which sold at 62s. per cwt. on one week will sell for 55s. the next, a difference of £3 10s. per 10 cwt. beast, and an item, one would have thought, of sufficient magnitude to have promoted farmers to combine together to achieve some measure of stabilisation.

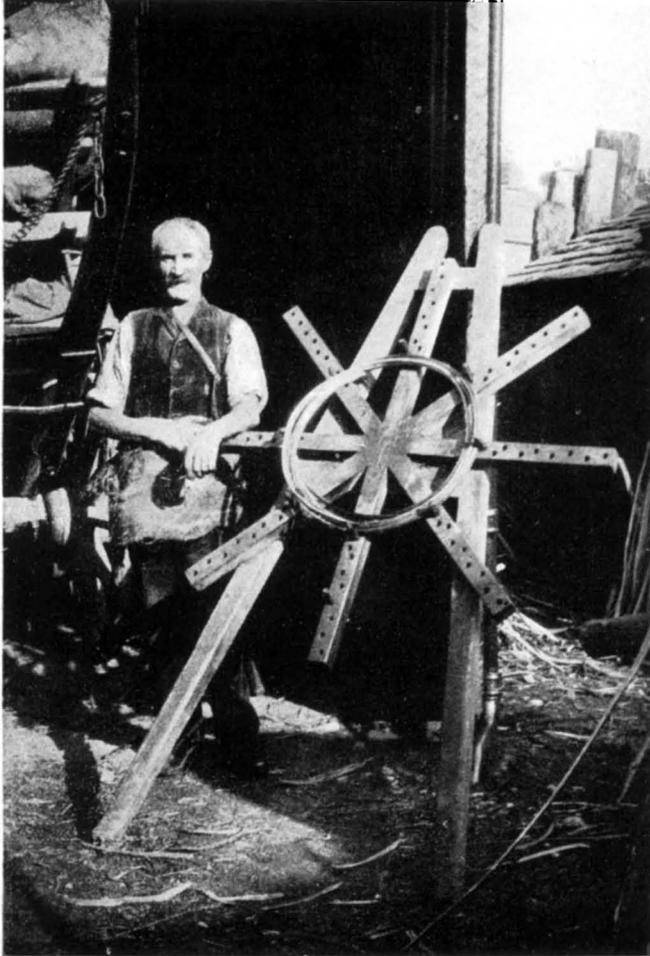
The producer of live stock is in a very weak position in negotiating a sale. He bargains as an individual either with the well-organised butchers, or with the dealer, whose skill in judging quality and weight and whose knowledge of prices is much superior to those of the farmer, and who, in many cases, enjoys a position from which he can exert financial pressure to his own advantage. The farmer's marketing position can be strengthened only by organisation from within the farming industry, this organisation probably requiring that the farmers themselves should assume at least one vital process in distribution, thereby assuring themselves, if necessary at any time, of at least equal influence with the middleman in the processes and costs of distribution.

With regard to the projected reports on milk and wool marketing, certain factors arise which do not affect the marketing of meat. While milk, like meat, is a highly perishable article, it is, unlike meat, of a uniform nature, and of steady and constant production ; as a result, both producer and distributor have been encouraged to organise in separate bodies to protect and foster their separate interests. As contrasted with live stock, where each farmer bargains individually, milk producers have built up a strong organisation for collective bargaining.

In the case of wool, the marketing problem concerns a by-product of the live stock industry, and a commodity that is not perishable. These factors introduce certain new elements, distinct from those applying to meat and milk, into wool bargaining.

With regard to both milk and wool, considerable preliminary work has been done in the collection and arrangement of materials.

Closely allied with the work of investigation ; work of an advisory nature is undertaken by the Institute, and particularly with regard to a retail butchers' society which a number of representative farmers propose to form at the present time. There is every prospect that this society will get under way, and, as the situation has been thoroughly reviewed beforehand, members are justifiably confident of success. The influence behind the formation of the society is



THE HOOPER

(From *The Rural Industries of England and Wales*, Vol. I.)

dissatisfaction with the uncertain prices received in the local markets. These farmers, seeking fair payment by weight for what they produce, have decided that, under existing conditions they can achieve this ideal in no way other than by combining together among themselves for slaughtering and selling their meat direct to the consumer.

Mr. F. J. Prewett, who is in charge of the research work, acts also as the advisory officer.

✓ 7. THE INSURANCE OF FARM LIVE STOCK

In the Report of the *Agricultural Tribunal of Investigation* the need for statistical data concerning the incidence of live stock mortality in this country was emphasised. Such information is of primary importance if anything is to be attempted in the direction of the extension of live stock insurance, and practically nothing is available at present. On the other hand, much work has been done in Continental countries to investigate the facts, and the information collected has been utilised largely for the formulation of insurance schemes.

In pursuance of the suggestion made by the *Tribunal*, work was begun on the collection of data in 1924, and at the same time a study of Continental data, of which a great deal exists, was undertaken. The work is in the charge of Mr. A. Jones, a research scholar of the Institute, and considerable progress has been made.

✓ II. RURAL LIFE STUDIES

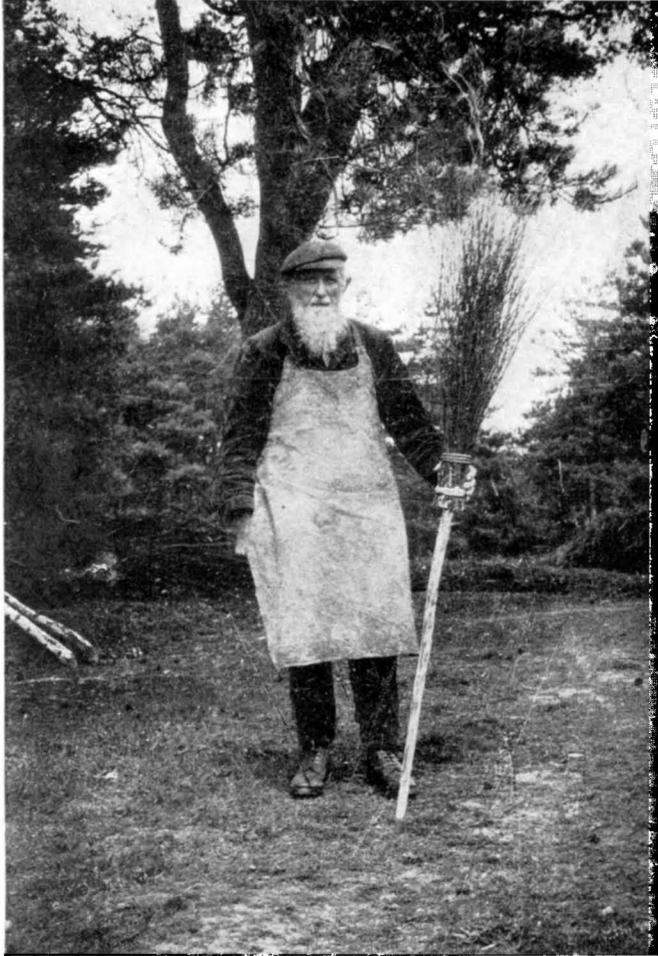
THE SURVEY OF RURAL INDUSTRIES

In any consideration of the development of the countryside the place and function of local industries in rural life must occupy a prominent position. Their importance in the past was obvious, when the village was largely an isolated economic unit, and in view of the part they might still play in maintaining a fuller life for the country dweller, in stemming the flow of population from the rural to the urban centres, and in solving some of the problems of modern industrialism, the need for a study of their present state, of the extent to which the changes in modern social and economic conditions demand their supersession, and of the possibility of adapting

and developing them to serve these same conditions, becomes increasingly apparent.

It may be that rural industries can continue to supplement agriculture in the complete rural community, by providing subsidiary employment for the part-time land-worker and the small holder ; by affording the chance of employment in their own homes or villages to the various members of their families ; by providing certain requisites of agricultural industry. It may be possible that in the revolution of economic principles and systems which is now being made by all sorts and conditions of persons certain human advantages in rural industries may be set against the greater production of goods by the larger industrial units of the towns. In particular, the smaller industrial concern enables a man to see the whole series of connections between the making and using of an article, and brings his work into direct relation not only with his own life, but with that of the community of which he is a member. There is little or no distinction between producer and consumer, and one of the chief causes of present social conflicts is non-existent. On the other hand, the moribund condition of many once-flourishing country trades and crafts may have to be recognised as the price of industrial progress in other centres. The modern tendency towards the centralisation of industry and large-scale production ; the enormous development of transport facilities which has broken down the barriers between town and country ; the danger of these small unorganised enterprises becoming sweated industries serving only to subsidise agricultural wages, all of these things may render undesirable any effort towards the resuscitation of many of these ancient crafts.

With so little knowledge available it became clear that a thorough investigation of the position of rural industries, both economic and social, would be advantageous, and, in 1919, at the suggestion of the Development Commissioners, an inquiry into the condition of rural industries in the neighbourhood of Oxford was undertaken by the Institute. It was rather of the nature of a trial trip, an experimental inquiry to explore the possibilities of a more complete investigation, and in the following year arrangements were made with the Development Commissioners and the Ministry of Agriculture for an extension of the survey so as to bring under review the principal rural industries of England and Wales.



THE BROOM SQUIRE
(From *The Rural Industries of England and Wales*, Vol. I.)

The terms of reference of those responsible for the work were to consider :

(1) The existing rural industries and the causes of their establishment in particular localities, such as easy access to local supplies of raw material and labour, and local markets for the finished products ;

(2) The various types of organisation in these industries, such as small factories and workrooms or individual production, organisations for the purchase of raw materials or the sale of finished products. Educational facilities and the possibilities of technical instruction were also to be borne in mind in this connection.

(3) The economic and social effects of rural industries, the conditions of labour attendant on them, the connection between rural industries and agricultural employment and how far such industries tend to depress or ameliorate the lot of the agricultural worker.

(4) The prospects of development of existing industries, and of the introduction of new enterprises or of the resuscitation of former industries now dead or in a state of suspended animation. In this connection the existence of competition, both urban and foreign, was to be borne in mind, and consideration given to the conditions under which rural industries can compete with urban production.

The survey was carried out during three years by a specially appointed group of workers. They surveyed the country, county by county, and the results of their inquiries were embodied in reports dealing with the industries of individual localities. From these interim reports (which are available in manuscript for consultation at Oxford), the final reports were compiled, dealing with the various industries separately as they occur throughout the country.

As has already been said, the first district surveyed was that of Oxfordshire, and the investigator in this instance was Miss K. S. Woods, who was assisted in part of the work by Miss C. D. Biggs.

✓ The results of the survey were embodied in book form and published in 1921.¹

From 1921 to 1922 the work was continued by Miss Woods and Miss H. E. FitzRandolph, and in the summer of 1922 Miss M. D. Hay took Miss Woods' place. The survey of the Welsh industries required a knowledge of the Welsh language and was undertaken apart from the English survey by Miss A. M. Jones, in 1922 and 1923.

✓ ¹ K. S. Woods, *Rural Industries Round Oxford* (Oxford University Press).

For convenience of publication the reports have been collected together in four volumes, as follows :

England.

- ✓ Vol. I. Timber and Underwood Industries and Some Village Workshops.
- ✓ Vol. II. Osier-growing, Basketry Industries and Some Rural Factories.
- ✓ Vol. III. Decorative Crafts and Rural Potteries.

Wales.

- ✓ Vol. IV. Rural Industries in Wales.

The general supervision of the Survey was in the hands of Mr. A. W. Ashby. Owing to his removal to Aberystwyth before the completion of the work, considerable delay was incurred in the publication of the reports, but Vols. I., II. and III. are now in the press, and Vol. IV. will be ready in the autumn.

III. MISCELLANEOUS STUDIES

1. THE AGRICULTURAL ATLAS

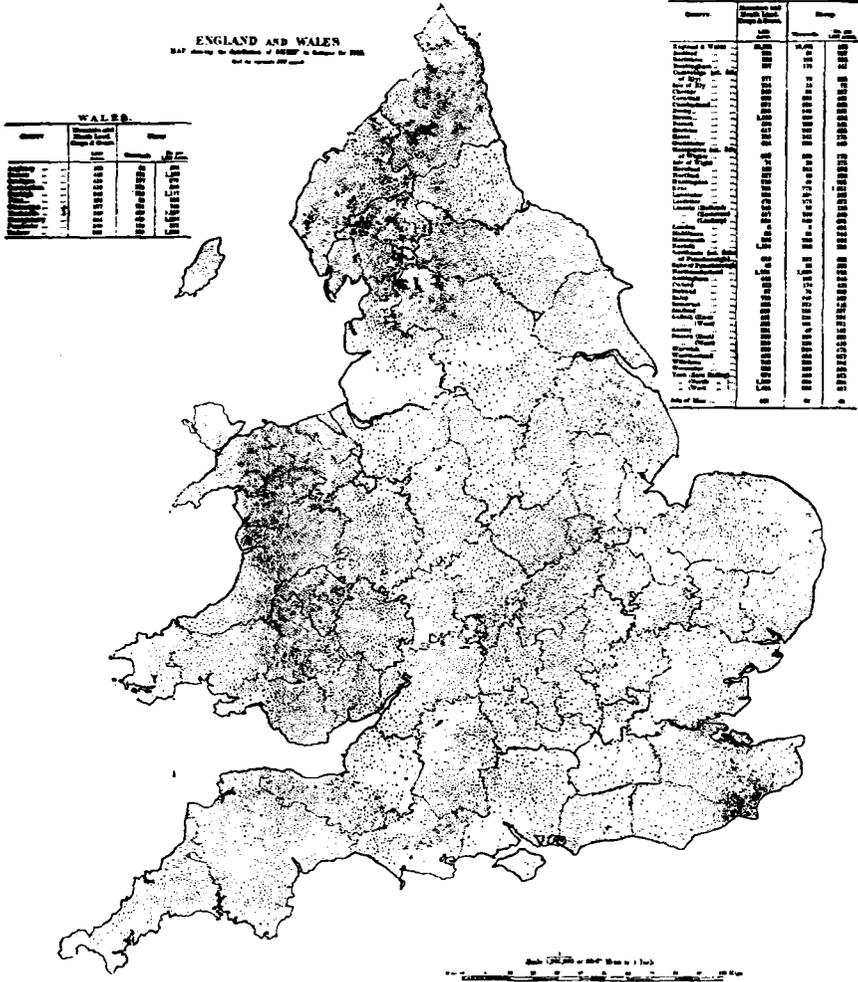
THE preparation of the Agricultural Atlas of England and Wales was undertaken with the object of facilitating the study of the organisation of the farming industry. Statistics of the acreage of crops and live stock on farms in England and Wales have been collected by the Ministry of Agriculture and Fisheries for many years, but in the form in which they are generally available only the statistics in each county can be obtained. It is known, however, that the system of cropping and the distribution of live stock vary very considerably within counties and that the county data do not localise farming practice. The present series of maps have been made for the purpose of indicating so far as may be possible on a small scale, these local differences, together with some of their causes. The smallest local area for which statistics can be used is the parish, and this Atlas has been based upon the Parish Returns for the year 1918 which were supplied by the Ministry of Agriculture and Fisheries. For the construction of the maps the series for each county was prepared separately on county outline maps, showing the parish boundaries, on a scale of four miles to the inch. This scale

tended towards greater accuracy in obtaining a correct distribution, but in order to produce the Atlas at such a price as would render it widely accessible, it was decided to reduce the maps and to publish them on the 1/1,500,000 scale. The distribution is indicated by uniform dots, which do not permit of an easy computation of totals, but the value of the dot is shown for each map and from the text accompanying them the acreage of crops or numbers of live stock can be ascertained for any county.

The causes of difference in the distribution within each county or over the county may be geological, climatic or economic in character. A Geological Map is therefore included, though the soil of the surface varies much more than the map indicates because of the soil drifts. Climatic conditions are jointly indicated by Relief and Rainfall Maps, though the small scale on which they are produced does not admit of complete localisation of all variations.

An Atlas of this kind should serve many purposes. It will help the investigator desirous of examining some particular branch of the agricultural industry by enabling him to locate, at a glance, the farming practice or food-product with which he is concerned. But it will do more than this ; very little information has been available hitherto on the correlation of surface geology, of rainfall, of altitude or of economic factors with various forms of agricultural practice met with in England and Wales, and the maps here reproduced should do much to facilitate research work in these directions. Further, for educational purposes in Elementary and Continuation Schools in rural districts throughout the country, as well as in Agricultural Colleges and Farm Institutes, this Atlas should be useful.

The Maps relating to the eight Eastern Counties were prepared under the direction of Mr. L. F. Newman, of the School of Agriculture, Cambridge. The preparation of the remainder was undertaken by the Institute under the supervision of Mr. J. Pryse Howell (now of the Agricultural Economics Department, Aberystwyth). The Agricultural Atlas is published by the Ordinance Survey Department, which also issues the individual maps on loose sheets, in a portfolio, for lecture-room purposes, and the maps comprising the Welsh counties have been issued by the department separately in the form of an Agricultural Atlas of Wales.



SHEEP DISTRIBUTION MAP (SUMMER).

(From *The Agricultural Atlas of England and Wales*)

2. ECONOMIC CHANGES IN LAND TENURE IN SCOTLAND SINCE 1870

The disastrous decline in agricultural prosperity from 1880 until the end of the century affected landownership as much as farming. Rents of farms which had increased steadily for the half century before 1880 declined rapidly after that date. Many economic problems of importance arose from time to time in the re-adjustment which was necessary to meet the new conditions.

From various published sources, it may be possible to show the extent of the decline in rents and to estimate the influence of the decline upon the maintenance of the landowners' equipment of agricultural land. The growth and changes in the burdens of local taxation for poor relief, education, and roads, as well as national taxation as it applies specially to landownership, are other important factors in the economics of landownership.

From the seventies onward, a new situation in land tenure developed with the Agricultural Holdings Acts. The economic (as apart from the legal) significance of the various Acts has been great in determining the state of landowning to-day.

An attempt is being made to study these various economic developments. The period commencing in 1870 includes the last decade of prosperity ; the twenty years of almost continuous depression ; and the slow revival from 1900 onwards.

This investigation is being carried out by Mr. J. P. Maxton, a research scholar of the Institute.

3. THE INCIDENCE AND EXTENT OF UNEMPLOYMENT IN AGRICULTURE

This enquiry was commenced in order to deal with more particular and local conditions than the Inter-Departmental Committee on Agricultural Unemployment Insurance may be expected to have been able to consider.

The effects of the recent changes in agriculture on employment of labour are being considered with special reference to the problem of the casual labourer. It is hoped to be able to gauge exactly the position such labour fills in the farm economy and to trace the continual movement in and out of agriculture of this class, in which there may be, at least, potential unemployment.

The enquiry is being carried out by Mr. M. A. Knox, a scholar of the Institute.

4. THE CONFORMATION OF THE COW IN RELATION TO MILK YIELD

A study somewhat different in character from those undertaken at the Institute hitherto was begun in January, 1926. It is an investigation to determine whether there is any correlation between the conformation and the milk yields of dairy cows.

For a long time past prizes have been awarded at agricultural shows for cows that have appeared, on inspection, to be good dairy cows ; standards of excellence as regards certain external points of conformation have been agreed, and cows are placed in order of merit according as they approximate to these standards. This investigation is designed to test their value.

With the collaboration of farmers in Berkshire, Oxfordshire and Wiltshire eighteen farms have been visited and nearly 600 dairy cows (pedigree and non-pedigree shorthorns) have been measured in respect of some twenty of these conventional points of excellence. Only cows that had been milk-recorded for a complete lactation were measured, and all cows under five years of age were eliminated. In addition to measuring such points as length from hocks to pins ; width at shoulders, heart, ribs, hocks, thurls, and pins ; length of tail ; circumference of tail at tail-head ; circumference of body at heart ; depth of body at heart ; thickness of skin on the udder and ribs, etc., notes were made on such points as fatness, handling of skin on udder, feel of udder, size and shape of milk veins and size of milk wells, etc. Each farmer was also questioned concerning his system of management, with the object of determining whether the cows had, in the different herds, been given more or less the same chance to give their best yields according to their ability to milk.

To find the experimental error of measurement eleven cows on the University Farm were measured, each of them, ten times. The milk yield for the lactation for each cow measured was corrected according to the scales prepared by H. G. Sanders, Cambridge, for length of dry period before calving, length of time between calving and service producing pregnancy, and also the month of year of calving. No correction was needed for age because the aim was to group the cows according to age.

At the present time the correlation of conformation and milk yield is being worked out, but results have not yet been obtained. The work is being carried out by Mr. F. H. Garner, an agricultural scholar of the Institute.

IV. THE ADVISORY PROVINCE

THE Institute undertakes advisory work in farm economics in the Advisory Province of Oxfordshire and Northamptonshire.

The main activities of this branch are concerned with costing and financial accounts, their keeping and interpretation, and with advisory and organisation work in connection with the marketing of farm produce. A description of this work has already been given in other sections (see pp. 11-13 and pp. 31-35).

In co-operation with the County Organisers for Oxfordshire and Northamptonshire lectures are arranged from time to time. In Oxfordshire, at various centres, courses on book-keeping, farm valuations, etc., have been given to farmers' sons, and in Northamptonshire single lectures on rating and taxation have been delivered to students and farmers at the County Farm Institute.

Mr. Bridges acts as Economic Advisory Officer, and supervises the work generally, whilst Mr. Prewett is concerned with the special problem of marketing farm produce.

V. EDUCATION

1. SCHOLARS

IN addition to its principal work in the field of research the Institute undertakes the supervision and instruction of post-graduate students holding scholarships, from the Ministry of Agriculture and Fisheries and the Board of Agriculture for Scotland, for the study of agricultural economic problems. These scholarships are divided into two classes. Scholars of the first class hold scholarships for three years, two of which are passed at the Institute, and have to devote their time to research work entirely. They usually become members of the University and submit theses for research degrees. Scholars of the second class hold training scholarships of one or two years, and while at the Institute they receive instruction in the methods of approach to the study of economic problems; they are

also expected to undertake investigations in the field in order to gain knowledge of the actual work. The scholars at present in residence in the research class are Mr. A. Jones and Mr. H. J. Meredith, and holders of training scholarships are Mr. J. R. Currie, Mr. F. H. Garner and Mr. J. L. Davies. The problems being studied and the investigations being undertaken by the scholars have already been referred to.

A further class of post-graduate students, who have been attached to the Institute, hold training scholarships from the Colonial Office to enable them to qualify for administrative posts in the Colonies. These scholars spend six months of their scholarship period at the Institute, and during this time they receive a course of instruction designed to give them a foundation in agricultural economics and in the methods adopted by the Institute for investigating economic problems. At the same time, with the help of University lecturers, the opportunity is taken of initiating these scholars into questions of Colonial administration and land settlement and into matters affecting the resources, development and trade of the Empire.

2. LECTURES

Apart from the lectures connected with the work in the Advisory Province to which reference has already been made, various members of the staff deliver lectures to Farmers' Clubs, Village Clubs, and similar organisations. A list of the lectures delivered since the publication of the former issue of this account of the work of the Institute includes the following :

C. S. Orwin.

Farming Facts and Fallacies	...	Wireless Broadcast Lecture.
Land Tenure	Fabian Society.
The Development of the Country Side		Oxfordshire Union of Village Clubs.

A. Bridges.

Sugar Beet	N.F.U., Abingdon.
Statistics of corn, meat and milk production.		Farmers' Discussion Society, Swindon.
The Importance of the wages bill in the farmers' budget, and the principles underlying wage fixing.		Farmers Discussion Club, Hampton in Arden.

F. J. Prewett.

The Organisation of Marketing ... N.F.U., Bridgnorth.

V. Liversage.

Economics of Production of Conference of dairy farmers
Grade A (T.T.) Milk at Reading University.

This account of the work of the Agricultural Economics Research Institute would be incomplete without a grateful acknowledgment of the obligation under which it rests to agriculturists throughout the country. To the officials of the Ministry of Agriculture, to the staff and members of the National Farmers' Union, both at Headquarters and in the County Branches, to individual farmers and other interested persons, to their fellow-workers in other branches of agricultural research—to everyone who has assisted them with help and encouragement the Director and his Colleagues desire to express their gratitude for the past, and their hope for continued collaboration in the future.

OXFORD, *June*, 1926.

VI. THE AGRICULTURAL ECONOMICS RESEARCH INSTITUTE

1. *ADVISORY COMMITTEE*, 1926

W. G. S. Adams, M.A. (All Souls), Gladstone Professor of Political Theory and Institutions.—*Chairman*.

H. E. Dale, M.A., C.B. (Balliol), Ministry of Agriculture and Fisheries.

R. Hart-Synnot, M.A., O.B.E., D.S.O. (St. John's).

G. T. Hutchinson, M.A., M.C. (Christ Church).

R. V. Lennard, M.A. (Wadham).

G. G. T. Morison, M.A. (Balliol), Reader in Agricultural Chemistry.

B. J. Owen, M.A., D.Sc., Director of the Agricultural Engineering Institute.

Sir Henry Rew, K.C.B., Late Assistant Secretary, Ministry of Agriculture and Fisheries.

Sir William Somerville, M.A., D.Sc., K.B.E. (St. John's), Professor *Emeritus*.

D. T. Thring, Hon. M.A. (Merton).

Vernon J. Watney, M.A., F.S.A. (New College).

J. A. Scott Watson, M.A., M.C. (St. John's), Sibthorpean Professor of Rural Economy.

2. *STAFF*, 1926

Director

C. S. Orwin, M.A. (Balliol).

Research Assistants

A. Bridges, M.A. (Lincoln), Advisory Economist.

W. R. Peel, M.A., D.S.O. (Balliol), University Lecturer in Agriculture.

R. N. Dixey, B.A. (St. John's).

F. J. Prewett, B.A. (Christ Church).

S. J. Upfold, M.C.

G. Frecheville, B.A. (Non-Coll.), M.A. (Cantab). *Honorary*.

Junior Research Assistants

J. F. W. Grange.

K. H. Johnston (Balliol).

L. D. Martin, B.A. (Worcester).

D. S. Skilbeck, B.A. (St. John's).

H. C. Stilgoe, B.A. (Christ Church).

E. Thomas, B.Litt. (Wadham), B.Sc. (Wales).

A. Whatham, B.A. (Cantab).

Clerical Assistants

A. R. Arnold.
E. Handlen.
J. S. Macnab.
H. E. Tresham.
R. G. Tubbs.

Secretary and Librarian

F. M. Baker, B.A. (St. Hugh's).

In addition to the regular staff a small number of Scholarship holders are always in residence, who participate in the work of the Institute.

Research Scholars (2 Years)

A. Jones (Exeter), B.Sc. (Wales).
J. P. Maxton (Balliol), M.A., B.Sc. (Glasgow).
H. J. Meredith (Exeter), B.Sc. (Wales).

Training Scholars (1 Year)

J. R. Currie, B.Sc. (Glasgow).
J. L. Davies, B.Sc. (Wales).
D. Drysdale (Brasenose), B.Sc., B.Com. (Edinburgh).
F. H. Garner, B.A. (New College).
A. D. Imper, B.Sc. (Aberdeen).
M. A. Knox (Brasenose), B.Sc. (Edinburgh).
T. Lewis, B.Sc. (Wales).
V. Liversage, B.Sc. (London).

VII. PUBLICATIONS.

A. BOOKS AND PAMPHLETS ON SALE.

(* Obtainable only on application to the Institute.)

- *The Work of the Agricultural Economics Research Institute.* 2nd issue. 1926. pp. 50. (Oxford University Press.) 1s.
- The Tenure of Agricultural Land.* C. S. Orwin and W. R. Peel. 2nd ed. pp. x + 79. (Cambridge University Press.) 3s. 6d.
- Farm Accounts.* C. S. Orwin. 2nd ed. pp. 140. (Cambridge University Press.) 5s.
- Farming Costs.* C. S. Orwin. 2nd ed. pp. 141. (Oxford University Press.) 8s. 6d.
- A Short System of Farm Costing.* H. R. J. Holmes. pp. 107. (Oxford University Press.) 6s. 6d.
- *Iwerne Minster Home Farm Cost Accounts.* A. Bridges. pp. 52. (Oxford University Press.) *Gratis.*
- A Simple System of Farm Book-Keeping.* A. Bridges. pp. 20. (Ministry of Agriculture and Fisheries, Miscellaneous Publications, No. 50.) 6d.
- Allotments and Small Holdings in Oxfordshire.* A. W. Ashby. pp. vi + 198. (Oxford University Press.) 5s.
- Agriculture in Oxfordshire.* J. Orr. pp. xii + 239. (Oxford University Press.) 8s. 6d.
- Agriculture in Berkshire.* J. Orr. pp. viii + 208. (Oxford University Press.) 8s. 6d.
- Sugar Beet.* The Results of an Inquiry into the Costs of Production, Yields and Returns in 1924. A. Bridges and R. N. Dixey. pp. 76. (Ministry of Agriculture and Fisheries. Research Monograph No. 3.) 3s.
- The Marketing of Farm Produce.* Part I. Livestock. F. J. Prewett. pp. viii + 103. (Oxford University Press.) 3s. 6d.
- The Productivity of Hill Farming.* J. Pryse Howell. pp. 23. (Oxford University Press.) 1s.
- An Economic Survey of a Rural Parish.* J. Pryse Howell. pp. 31. (Oxford University Press.) 1s.
- *Rural Industries round Oxford.* K. S. Woods. pp. 180. (Oxford University Press.) 7s. 6d.
- An Agricultural Atlas of England and Wales.* J. Pryse Howell. pp. 22. (Ordnance Survey Department, Southampton.) 10s.

An Agricultural Atlas of Wales. J. Pryse Howell. pp. 23. (Ordnance Survey Department, Southampton.) 5s.

Rural Education. A. W. Ashby (with P. G. Byles). pp. 227. (Oxford University Press.) 2s. 6d.

Miscellaneous Papers in Agricultural Economics. Vol. I. 1913-18. (Out of print.) 10s.

Miscellaneous Papers in Agricultural Economics. Vol. II. 1919-22. (Out of print.) 10s.

**Miscellaneous Papers in Agricultural Economics.* Vol. III. 1923-25. 10s.

In the Press :

Estate Accounts. C. S. Orwin (with H. W. Kersey).

The Rural Industries of England and Wales.

Vol. I. *Timber and Underwood Industries and some Village Workshops.*

Vol. II. *Osier Growing, Basketry Industries and some Rural Factories.*

Vol. III. *Decorative Crafts and Rural Potteries.*

Economics of Production of Grade A. (T.T.) Milk. V. Liversage.

B. ARTICLES PUBLISHED IN CONTEMPORARY JOURNALS. (June 1925-June 1926.)

(† A few reprints available free on application to the Institute.)

†*The Comparative Cost of Mangolds and Silage.* C. S. Orwin and H. W. Kersey. (Journal of the Royal Agricultural Society, Vol. 86, 1925, pp. 48-59.)

†*A Note on the Cost of Mole Draining.* T. Lewis, V. Liversage and A. D. Imper. (Journal of the Royal Agricultural Society, Vol. 86, 1925, pp. 43-48.)

†*A Study of the Sugar Beet Position.* A. Bridges and R. N. Dixey. (Journal of the Royal Agricultural Society, Vol. 86, 1925. pp. 59-89.)

†*Some Aspects of the Sugar Beet Question.* A. Bridges and R. N. Dixey. (National Farmers' Union Year Book (Oxfordshire Branch). pp. xxxi-xlvi. 1925.)

Research in Farm Management and Agricultural Organisation. C. S. Orwin. (Farmer and Stockbreeder, September 14th, 1925.)

A Review of the Liberal Party Land Scheme. C. S. Orwin. (Manchester Guardian, November 14th, 1925.)